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PRELIMINARY NOTICE OF A NEW VEGETABLE COLORING MATTER.

BY SAM. P. SADTLER AND WM. L. ROWLAND.

Read at the Pharmaceutical Meeting December 21st, 1880.

Some months since our attention was drawn to a variety of wood, called *Beth-a-barra*, which had been recently imported from the west coast of Africa, and was much valued for its extreme toughness and its capability of receiving a high polish.

The wood is compact, very heavy and in color very nearly resembles ordinary black walnut. On close examination, however, the interstices of the fibres are plainly seen to be filled with a yellow crystalline powder. In this respect it differs from logwood, barwood, camwood and red sandal wood, with which it was compared. In these woods the color is uniformly disseminated, the fibre appearing as if soaked in a solution of corresponding color. It resembles more closely the yellow coloring matter of rhubarb and of araroba, or goa-powder, which compound, chrysophanic acid, occurs also as a loose yellow crystalline powder in the interstices of the root. Special attention was, therefore, paid to its resemblances to this compound, as well as to those of the well-known dye-woods mentioned above.

A cross-section of the Beth-a-barra wood appears very similar to the fernambouc and sappan woods, from which brasilin is obtained (this Jour., p. 348, 1880). It bears very little resemblance, however, to the sections of logwood and the other therein-mentioned woods (*loc. cit.*, p. 351).

The coloring principle was extracted from the shavings, or better yet, the sawdust and raspings of the wood, by heating with distilled water containing a little sodium carbonate. This produced a deep claret-red solution, which was then filtered. To the filtrate acetic acid was added in slight excess, precipitating the coloring matter in a fine flocculent condition; this was filtered, washed and then dissolved in

hot 80 per. cent. alcohol, from which it crystallized upon cooling. By successive crystallizations the pure substance was obtained.

The material thus gotten was a tasteless, yellow compound, apparently crystallizing in scales or needles. Upon examination under the microscope these plates are found to be made up of a series of flat prisms, joined laterally. The crystals are unchanged in dry or moist air, insoluble in cold water, very slightly soluble in hot water, but readily soluble in alcohol or ether. The presence of even a trace of alkali or alkaline carbonate also causes it to dissolve with deep claret-red color. The crystals melt at 135°C.

Two lots were prepared for analysis; one was dried at 100°C., and the other at 125°C.

Analysis of material dried at 100° *C.*

	I.	II.	Mean.
Carbon,	68·75	68·79	68·77
Hydrogen,	6·05	6·05	6·05
Oxygen,	25·20	25·16	25·18
	100·00	100·00	100·00

Analysis of material dried at 125° *C.*

	I.	II.	Mean.
Carbon,	75·82	75·00	75·41
Hydrogen,	6·39	6·69	6·54
Oxygen,	17·79	18·31	18·05
	100·00	100·00	100·00

The mean of the results of the analysis of that dried at 125°C. would give a formula $C_{28}H_{29}O_5$, or possibly $C_{22}H_{23}O_4$, while that dried at 100°C. would be $C_{28}H_{29}O_5+3H_2O$.

The accepted formula for hæmatoxylin, the coloring material of logwood, is $C_{16}H_{14}O_6$ ("Deutsch. Chem. Ges. Ber.," 1871, p. 329), which would give 63·57 per. cent. of carbon and 4·63 per cent. of hydrogen.

Taking the work done within the past few years on hæmatoxylin as a guide, the action of numerous reagents was then tried upon the new coloring matter. We will give for comparison the results arrived at with hæmatoxylin and then state our results with the Beth-a-barra color.

Sodium amalgam has no action upon hæmatoxylin; with this coloring matter, however, we obtained, on treatment with sodium amalgam, a white compound, which under the microscope is seen to be crystallized in fine needles. The examination of this we reserve for a future communication.

A drop of nitric acid added to the etherial solution of hæmatoxylin in the cold rapidly oxidizes it; nitric acid oxidizes this coloring principle only when concentrated, and with the aid of heat, giving rise to a white crystalline compound, soluble in ether, which gradually decomposes on exposure to the air.

Hæmatoxylin, when fused with potassium hydrate, yields pyrogallic acid; this material, on fusion with potassium hydrate, yields no pyrogallic acid.

When hæmatoxlyin is treated with ammonia solution and is allowed to stand in contact with the air for several days an oxidation product is obtained ("Hand. der Chem.," iii, p. 542); the Beth-a-barra principle, treated in this manner for several days, shows no signs of any oxidation or change.

Reagents.	Brasilin.	Hæmatoxylin.	Santalin.	Beth-a-barra.
Alkalies,	Claret-red sol.	Reddish-purple sol.	Claret-red sol.	Claret-red sol.
Acids—weak,	Orange ppt.	Pink solution	Light red ppt.	Yellow ppt.
Acids—conc.,	Yellow solution	" "	Dark red sol.	Yellow sol.
Alum sol.,	Crimson-red ppt.	Yellow solution passing into violet	Santalin thrown out	Coloring matter thrown out, does not combine with Al_2O_3
Lime water,	Crimson ppt.	Bluish purple ppt.	Red'sh-brown ppt.	Acts like alkalies
Ferrous salts,	Purplish-bl'k ppt.	Bluish-black ppt.	Reddish-violet ppt.	Fine reddish chocolate ppt.
Ferric salts,	Brownish-red ppt.	Black ppt.	Red'sh-brown ppt.	Chocolate-brown ppt.
Copper salts,	Brownish-red ppt.	Purple sol.	Red ppt.	Brown changing to yellow ppt.
Lead salts,	Crimson-red ppt.	Violet sol.	Reddish-violet ppt.	Brick-red precipitate
Mercuric salts,	Yellow ppt.	Yellow sol.	Scarlet ppt.	Orange-yellow ppt.
Silver salts,	" "	Gray ppt.	Red'sh-brown ppt.	Deep red ppt.
Tartar emetic,	Rose-colored ppt.	Purple sol.	Cherry-colored ppt.	Orange ppt.
Stannous chloride,	Red ppt.	Purple ppt.	Red ppt.	Yellow ppt.
Sodium Aluminate,	Claret-red ppt	" "	" "	Claret-red ppt

It is a noteworthy fact, that though this substance contains more hydrogen relatively than brasilin or hæmatoxylin, it does not oxidize as readily, but is reduced more readily than either of these coloring com-

pounds. The above table has been prepared, showing the action of a series of reagents upon several of the common coloring principles with the results obtained with this coloring material. The brasilin and santalin were extracted directly from the woods with alcohol, and the other two were alcoholic solutions of the crystallized coloring matters.

The following references, all of them from the "Berichte der Chem. Gesellschaft," show what has been done with the investigation of these vegetable coloring matters in late years: Franz Reim—"Ueber das Hæmatoxylin," Ber., 1871, p. 329; Adolf Bæyer—"Ueber das Gallein," Ber., 1871, p. 457; E. Kopp—"Ueber Brasilin und Resorcin," Ber., 1873, p. 446; C. Liebermann and O. Burg—"Ueber Brasilin," Ber., 1876, p. 1883; Richard Meyer—"Verhalten des Hæmatoxylins bei der trockenen Destillation," Ber., 1879, p. 1392; E. A. Letts—"Ueber das Phtaleïn des Hæmatoxylins," Ber., 1879, p. 1651.

A comparison of the Beth-a-barra coloring material with chrysophanic acid, the yellow coloring principle of rhubarb and goa powder, was then made in order to see what resemblance there might exist between the two.

Chrysophanic acid forms golden-yellow scales, melts at 162°C., forms deep red-colored solutions with caustic alkalies or ammonia from which the acid is precipitated in yellow flakes on neutralizing the solution with acid. Caustic soda will extract the color from solutions of chrysophanic acid in ether, chloroform, benzol or petroleum benzin, yielding deep red solutions; ammonia will extract the color from solutions in ether or petroleum benzin, but not from chloroform or benzol solution. An ammoniacal solution is precipitated lilac by acetate of lead and rose colored by alum.

The Beth-a-barra color looks like chrysophanic acid, but fuses at 135°C.; forms solutions with alkalies like those of chrysophanic acid. Caustic soda and ammonia both will extract the color from solutions in ether, benzol, petroleum benzin and chloroform. An ammoniacal solution is precipitated brick-red by acetate of lead, and no compound apparently is formed in alum solutions. Chrysophanic acid, when ignited with zinc dust, yields methyl-anthracene; this compound similarly treated yields phenol-like bodies with the odor of wood-tar creosote, and soluble in alkali with violet color. Finally, the percentage composition of this compound, before quoted, differs too decidedly from that of chrysophanic acid which requires 70·87 per cent. carbon and 3·94 per cent. hydrogen.

Nor does the Beth-a-barra principle correspond exactly with chrysarobin, which Liebermann and Seidler found[1] to be the chief constituent of goa powder. That compound dissolves in strong potassium hydrate solution with yellow color and green fluorescence. Its percentage composition moreover demands 72·29 per cent. of carbon and 5·22 per cent. of hydrogen. By heating with caustic potash solution in contact with air it is changed into chrysophanic acid.

The similarity of the Beth-a-barra principle in many of its reactions to these two compounds leads one to suspect a relationship. We hope to be able to settle what this relationship is shortly by a fuller study of its reactions and derivatives.

Philadelphia, Dec. 21, 1880.

ABSORBENT COTTON.

By Frank L. Slocum.

Absorbent cotton has in the last few years taken such an important place among the necessities and conveniences of the pharmacist and physician that it is very desirable for the pharmacist to be able to procure or himself manufacture it. The manner in which it is prepared is kept secret, and there is no literature on the subject up to the present time, it is believed.

At the request of Prof. Maisch some experiments have been made, the following process yielding the most satisfactory results.

Take of the best quality of carded cotton batting any desired quantity and boil it with a 5 per cent. solution of caustic potassa or soda for one-half hour, or until the cotton is entirely saturated with the solution, and the alkali has saponified all oily matter. Then wash thoroughly, to remove all soap and nearly all alkali; press out the excess of water, and immerse in a 5 per cent. solution of chlorinated lime for 15 or 20 minutes; again wash, first with a little water, then dip in water acidulated with hydrochloric acid, and thoroughly wash with water; press out the excess of water, and again boil for 15 or 20 minutes in a 5 per cent. solution of caustic potassa or soda; now wash well, dipping in the acidulated water and washing thoroughly with pure water. Afterwards press out and dry quickly.

Boiling with caustic alkalies saponifies all oil and greasy matter, and the soap formed is removed by washing; if it were not washed out

[1] "Ber. der Chem. Ges.," 1878, p. 1603.

before bleaching, an insoluble lime soap would be formed and precipitated on the fibres. Dipping in very dilute hydrochloric acid after bleaching renders the removal of calcium compounds more easy. At this stage the cotton has all the appearance of absorbent cotton, but it absorbs water rather slowly; when again boiled with a caustic alkali, more organic matter of a non-greasy nature is removed, and the cotton is rendered perfectly absorbent. On dipping the cotton in dilute hydrochloric acid at the last washing a chloride is produced with the caustic base used, which is more readily washed out than the alkali itself.

The amount of loss by this process is practically 10 per cent. A sample of 360 grs. lost, on boiling with alkali and bleaching, 15 grs., or 4·17 per cent., and 270 grs. of this bleached sample lost, on again boiling with an alkali, 14 grs., or 5·18 per cent, a total loss of 9·35 per cent.

There are on the market two brands which are principally sold, and are held at wholesale at the following prices:

In one pound rolls,	65c.	and	$1.12 per pound.
one-half pound rolls,	75c.		1.35
one ounce boxes,	$1.25		——
one-half ounce boxes,	——		2.25

Each of the half ounce boxes contains about 1·45 grs. of cotton.

Good cotton costs at retail about 25 cents per pound; enough alkali to wash it will cost say 10 cents, and chlorinated lime 2 or 3 cents; loss in manufacture 10 per cent., which equals 3 cents—making a total cost of material from 40 to 45 cents per pound. This is not counting time, wear of apparatus, fuel, etc. From these data any one can figure out the handsome profit gained by using his leisure moments not otherwise employed in making his own absorbent cotton. The process is simple and easily performed, requires little attention and gives satisfactory results, and if care is taken not to wad the cotton or tear it apart from its original carded form, it will, when dry, pull apart readily and look as nice as the commercial samples, except the commercial is recarded and is in one sheet, but otherwise it is its equal.

A microscopical examination was made to ascertain the change that takes place in the cotton by this process. Cotton fibres are tubes, with two sides collapsed together, forming ribbon-like fibres; at each edge the fibre does not come wholly together, thus leaving two tubes, one on each edge of the fibre. If one end of the crude cotton fibre be brought in contact with water, capillary attraction is generally soon

stopped in the tubes by oil, and no capillary attraction whatever takes place in the fibrous structure itself. After the cotton has been rendered absorbent the fibres will absorb water throughout their whole structure, and the collapsed fibres will distend.

Hence, absorbent cotton is cotton entirely freed from all matter that will obstruct capillary attraction.

OLEUM BETULÆ EMPYREUMATICUM AND TINCTURA RUSCI.

BY THE EDITOR.

Three correspondents in New York have favored us with the information that *Tinctura rusci* is not a tincture of the obsolete butcher's broom, as we suggested on page 33 of the January number, but that it is an alcoholic solution of birch oil, or rather birch tar, which is largely manufactured in Russia and Poland, from birch bark, by a process of descending distillation similar to that employed in the preparation of ordinary tar. This birch tar resembles wood tar in appearance, but has a peculiar penetrating odor, and is used in the manufacture of Russia leather, which owes to it its peculiar odor. Its common name is *degutt* or *dagget*, and it was formerly employed in medicine and in veterinary practice under the following names and synonyms: *Oleum betulinum*, s. *rusci*, s. *russicum*, s. *moscoviticum*, s. *lithauinicum*.

Birch tar contains, probably, the principal constituents of common wood tar. By distillation, A. Sobrero, in 1842, obtained a brown oily liquid, of a strong odor, lighter than water, and of an acid reaction. On fractionating this product near 100°C. a pale yellow oil was obtained having an agreeable odor, resembling that of turpentine and birch bark, and an acid reaction. After treatment with potassa and lime water it was again rectified, and had then a more agreeable smell, like birch bark. Its composition was found to be $C_{10}H_{16}$. It dissolves in alcohol and ether, and is a solvent for resins. Between —16° and —17°C. (about 2°F.) it congeals partly; its boiling point is 156°C. This is the only analysis of birch tar with which we are acquainted; the principle to which the strong odor of birch tar is due does not appear to have been chemically examined.

Recently, birch tar has been to some extent prescribed in New York in the form of *tinctura rusci* and *pomatum rusci*, occasionally simply

as *rusci*. There does not appear to be any authoritative formula for either preparation; for, while one correspondent informs us that they are usually made by mixing one part of birch tar with three or four parts of alcohol, or the pomade with three or four parts of soft paraffin, another correspondent send us the following formula for the tincture:

℞	Olei rusci,		10·0
	Alcoholis,		
	Ætheris,	*aa*	15·0
	Olei lavandulæ,		
	" rosmarini,		
	" rutæ,	*aa*	0·4

Mix and filter.

This is Hager's formula for the external use of birch tar in rheumatism and gout, except that Hager orders 0·5 gram of each of the volatile oils.

Hager, in "Pharm. Praxis," gives, also, the following for *Essentia Rusci:*

℞	Olei rusci,	10·0
	Alcoholis,	100·0

Mix, and, after decantation, filter.

Birch tar has also been used in menorrhœa, piles, cancer, venereal ulcers, as an anthelmintic, and in intermittent fever, in doses of from 6 to 10 grains three times daily, usually in the form of pills. At present it seems to be mainly employed in skin diseases, and the pomade referred to above is often sold in New York as *Hebra's tar pomade.*

Taxus baccata.—D. Amato and A. Capparelli have isolated from the green needle-shaped leaves of the yew an alkaloid, which is colorless, crystalline, of a musty odor and produces dense white fumes with the vapors of hydrochloric acid. It is sparingly soluble in water, freely soluble in alcohol and ether, and yields precipitates with several reagents for alkaloids, those with solution of iodine in potassium iodide and with tannin becoming crystalline ("Gaz. Ital.," x, p. 349). Similar results were obtained by Marmé, see "Amer. Jour. Pharm.," 1876, p. 353.

Amato and Capparelli obtained also a volatile oil resembling that of wild fennel in odor, and a colorless non-nitrogenous principle, crystallizing in stellate needles, which are sparingly soluble in cold, but freely so in hot alcohol.

THE ORTHOGRAPHY OF THE UNITS OF THE FRENCH METRIC SYSTEM.

By Oscar Oldberg, Phar.D., Med. Purveyor, M.H.S.

Professor Remington's very interesting paper on the above subject in the January number of the "American Journal of Pharmacy" presents strongly the views of those who prefer to write *gramme*, *litre*, etc.

There are many things to be said on both sides of the question. The spelling *center*, *meter*, *liter*, etc., is not so far removed from the derivations of these words as to leave any doubt about their source or meaning. Orthography lies between derivation and pronunciation, and many think that it should come as near to pronunciation as may be possible without ignoring derivation entirely. Again, if we must insist upon great nicety in preserving the original spelling, we should write *thermometre*, and that a thermometer is a heat measurer and not a heat measure Professor Remington will, of course, admit. It is not probable that *meter* will be used to designate measurer exclusively, nor that *metre* will be used to designate measure exclusively. Finally, the words incorporated into the English, as well as in other languages, from the French, although they may at first retain the French spelling, always change as to their orthography after a time, unless already in harmony with the characteristics of the language into which they are adopted. No one will doubt that a century hence we would write *gram*, even if we should now write *gramme*. To improve the spelling "a little" to suit our ideas does not rob the French nation of the least particle of the credit due them for originating this most perfect of all known systems of weights and measures; it only discourages the introduction of French spelling into the English language. We should look at the question from a practical rather than a sentimental standpoint. No one will say that the word thermometer is not English, and it will be hardly claimed that *meter*, even if spelt *metre*, is not an English word if we make it so. Even *gramme* would be English should we choose to adopt that orthography, but *gram* is more English than *gramme*.

With reference to the similarity between *grains* and *grams*, and between gr. and Gr., I have rarely, if ever, seen the words written out in full in prescriptions, and when written in full they might be written *grains* and *Grams;* and Gr. is not the adopted abbreviation of gram,

but gm. is the abbreviation used. Moreover, in writing prescriptions in the old system of weights Roman numerals are invariably used and placed *after* the sign which represents the weight unit, thus: gr.x, ʒj, etc., whereas, in metric prescriptions, Arabic numerals are used, and invariably placed *before* the gm.

Professor Remington calls attention to the fact that the term *gramme* is now in use by millions; but it may be added that *gram*, and *gramm*, and *gramma* are also in use by millions—*gram* being the term used in the Scandinavian countries, and now to a great extent in English-speaking countries, especially in the United States; *gramm* is the term used in Germany, and *gramma* in Russia. Other terms, derived from the same root, are used in other countries. In proposing the adoption of the *gram* we only favor the adoption of the shortest, most convenient and most English term, one that is fully as well understood as *gramme*, and one that no one will fail to recognize at once. The same may be said of *meter* and *liter*, except as to the point of brevity.

Washington, D. C.

CHEMICAL NOTES.

By Professor Samuel P. Sadtler, Ph.D.

Inorganic Chemistry.—*Existence of Ice at High Temperatures.*—Prof. Thos. Carnelley has made a series of most interesting experiments on the conditions of melting of solids. He finds that, just as in order to convert a gas into a liquid the temperature must be below a certain point, termed the *critical temperature*, of the substance, no matter what the pressure, so in order to convert a solid into a liquid the pressure must be above a certain point which he calls the *critical pressure* of the substance, otherwise no amount of heat will melt the substance. After several unsuccesful attempts he was so fortunate as to attain the most perfect success in the case of ice, obtaining solid ice at temperatures so high that it was impossible to touch it without burning one's self. On one occasion a small quantity of water was frozen in a glass vessel which was so hot that it could not be touched by the hand without burning it. Ice was kept for considerable lengths of time at temperatures far above the ordinary boiling point, and even then it sublimed away without any previous melting. These results were obtained by *maintaining* the superincumbent pressure below 4·6 mm. of mercury, *i. e.*, the tension of aqueous vapor at the freezing-

point of water. Other substances exhibit these same phenomena, the next notable of which is mercuric chloride, for which latter the pressure need only be reduced to about 4·20 mm. On letting in the pressure the substance at once liquefies.—*Chem. News*, vol. 42, p. 130.

Preparation of Hydrochloric Acid.—When it is desired to have a regulated stream of hydrochloric acid gas for any purpose, it can be readily gotten, according to L. de Koninck, by the action of sulphuric acid upon ammonium chloride, reference being also had in the construction of the apparatus to the fact that a solution of ammonium sulphate in sulphuric acid is lighter than sulphuric acid itself:—*Ber. der Chem. Ges.*, xiii, p. 2240.

Method for the Quantitative Determination of Nitric Acid.—O. von Dumreicher has found that nitric acid is converted by acid stannous chloride solution into ammonia without any evolution of gas. To apply this fact to the determination of nitric acid the substance containing the nitric acid is boiled for an hour with a large excess of acid stannous chloride solution (16 parts of tin dissolved in 60 parts of 40 per cent. hydrochloric acid) and then evaporated over the water-bath until a crystalline scum begins to form. In this residue of evaporation the ammonia can be determined in the usual way.—*Ibid.*, p. 2241.

Potassium and Sodium Aluminates.—A. B. Prescott has found that when a solution of potassium alum is treated with caustic potash solution until the precipitate formed was just dissolved, no matter what the concentration of the solution was, the proportion of potassium to aluminum in the soluble aluminate is represented by the formula $K_2Al_2O_4$ or $Al_2O_2(OK)_2$, the equation being:

$$K_2Al_2(SO_4)_4+(KOH)_8=K_2Al_2O_4+4K_2SO_4+4H_2O.$$

The same compound is obtained by saturating caustic potash with aluminum hydrate, evaporating to dryness and extracting the excess of alkali with alcohol. The same results were also obtained with sodium aluminate.

Prescott finds, moreover, that the zinc-alkali compound has the composition K_2ZnO_2 or $Zn(OK)_2$ or, for the soda compound, Na_2ZnO_2.—*Chem. News*, vol. 42, pp. 29 and 30.

ORGANIC CHEMISTRY.—*On Saccharin and Saccharic Acid.*—Scheibler has investigated the saccharin discovered by Peligot, and obtained by him from the mixture of dextrose and levulose, called invert sugar. Peligot gives it the composition $C_{12}H_{22}O_{11}$ because it has the same percentage composition as cane sugar (saccharose). Scheibler finds that

its formula should be $C_6H_{10}O_5$ and that it is the anhydride of an acid, $C_6H_{12}O_6$. Saccharin fuses at 160° to 161°C. Its behavior with the alkaline earths distinguishes it from cane-sugar, milk-sugar, trehalose and the members of the cane-sugar group. They form weak compounds with lime and baryta, which are decomposed already by carbonic acid gas. Saccharin gives rise to true saccharates, a much more stable class of compounds. The free saccharic acid, when liberated from the combination, however, gives up a molecule of water, and the anhydride saccharin is formed. It therefore belongs, in Scheibler's opinion, to the class of lactones discovered by Fittig.—*Ber. der Chem. Ges.*, xiii, p. 2212.

Flavescin, a New Indicator in Alkalimetry.—F. Lux recommends as an indicator a coloring matter which he calls flavescin. It is obtained from oak shavings by distilling them with steam after heating in moist air to 220° to 260°C. The acid distillation is exhausted with ether and the solution evaporated to dryness to free it from acetic acid, when the residue is taken up with water. The solution when very much diluted will still be colored yellow by alkalies and decolorized by acids. Neutral alkaline carbonates color it yellow, but bicarbonates leave it uncolored. It may, therefore, serve not only as an indicator for alkali, but for carbonic acid as well. In this case it is necessary to work with solutions to which some 33 per cent. of alcohol has been added.—*Zeit. für Anal. Chem.*, 19, p. 457.

On the Behavior of certain Resins when Distilled with Zinc Dust.—K. Bötsch finds that dragon's blood, freed from the constituents insoluble in alcohol and distilled with zinc dust, yields styrol, toluol, ethyl benzol and a liquid boiling at 200° to 300°C., from which he separated a phenol-like body (boiling at 236° to 240°C. and possessing approximately the composition $C_{16}H_{20}O_3$), as a very pleasant smelling oil (boiling at 214° to 215°C., and possessing the formula $C_{11}H_{16}O$, and an oil of less pleasant odor of the formula $C_{13}H_{20}O$) and boiling at 256° to 260°C. The chief constituent of the crude distillate is the styrol (some 66 per cent.) and then the ethyl-benzol and the others in smaller amount.

He has also submitted to similar treatment guaiacum resin purified by alcohol, and obtained a distillate containing 50 per cent. cresol, 30 per cent. toluol, meta- and paraxylol, a little pseudo-cumol (boiling point 166°C.), and a hydrocarbon, $C_{12}H_{12}$. This last sublimes in thin, bluish-fluorescing scales which fuse at 97° or 98°C. and dissolve in

sulphuric acid with green color. Its picric-acid compound fuses at 123°C. It corresponds with the hydrocarbon *guaicen* prepared by Wiesner.—*Wien. Acad. Ber.*, 82, ii, p. 479.

Method for the Preparation of Benzoic Acid, Benzoic Ether and Benzoic Aldehyd.—Emil Jacobsen has patented in Germany (Patent No. 11,494) a general method for the preparation of benzoic acid, benzoic ether and benzoic aldehyd from benzo-trichloride or benzo-dichloride in the presence of certain metallic salts. If benzo-trichloride (the simple chlorine derivative of methyl-benzol or toluol) be heated with a little glacial acetic acid and zinc chloride (or anhydrous zinc acetate) in a flask with inverted condenser, and the amount of water necessary for the formation of benzoic acid be allowed to flow in gradually, we obtain benzoic acid according to the reactions:

$$C_5H_5CCl_3+2CH_3COOH=C_6H_5COOH+2CH_3COCl+HCl$$
$$2CH_3COCl+2H_2O=2CH_3COOH+2HCl.$$

Formic and oxalic acids will act in the same way as acetic acid.

Benzo-dichloride under similar conditions yields benzoic aldehyd (natural oil of bitter almonds).

$$C_6H_5CHCl_2+CH_3COOH+H_2O=C_6H_5CO.H+CH_3COOH+2HCl$$

The two chlorides act upon the ethers in the same way as upon the free acids. Thus, if acetic ether be used we would get benzoic ether instead of benzoic acid.

The zinc salts can be replaced by antimony trichloride or cupric chloride.—*Chem. Industrie*, Nov. 1880, p. 384.

Mixture for Writing on Glass.—The following notes will complement the remarks made on the above subject on page 600 of the last volume of this journal:

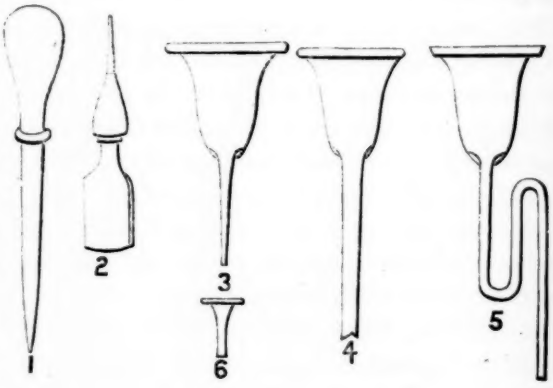
Liquid hydrofluoric acid etches glass leaving a smooth surface; the fumes of the acid, however, act on glass leaving a slightly rough surface.

Ammonium fluoride dissolved in water etches a still rougher surface on slight heating; but if this salt be mixed with an equal bulk of barium sulphate, moistened with water and gently heated, a very rough and opaque surface is produced. F. L. Slocum.

THE USE OF THE RUBBER NIPPLE IN PHARMACAL AND CHEMICAL MANIPULATIONS.

By Henry Biroth.

The Maw's or small nipple is in use for making pipettes or medicine droppers, and nearly every pharmacist is familiar with them; Fig. 1 being a representation of such an instrument. But the larger nipple can be advantageously used for the same purpose, as described further on, under No. 9, as well as for a number of other purposes, viz.:



1. As a *suppository mould.* Punch a dozen holes, large enough to hang the nipples in, into the cover of a tin seidlitz powder box, as in Parrish's mould. Dust the inner side of the nipple with lycopodium, and do not mind the perforation at its top, the melted cacao butter not passing through. With some experience you can make as nice a suppository as with high-priced machines.

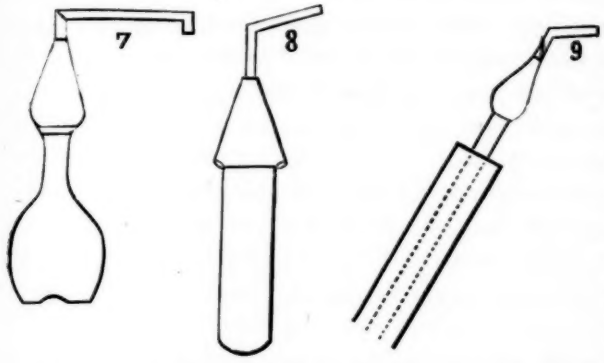
2. For making *rubber corks.* Moisten a common cork of any convenient size, slip the nipple tightly over it, trim off the rim if necessary, and the cork is ready. It is useful in many cases, as, for instance, for syrup or mucilage bottles. Such a stopper can be readily cleaned, and as it does not stick to the bottle it consequently is not so liable to break.

3. As a *funnel.* Insert a small and short glass tube in the top hole of the nipple, as in Fig. 3. By flanging one end of the tube it is prevented from slipping through. This can easily be done by softening the end over a spirit lamp and flanging it with the blade of a pocket knife, Fig. 6. In the same manner a funnel tube, Fig. 4, and a safety tube, Fig. 5, can be constructed.

4. In place of *perforated corks.* A test tube, a Florence flask, or retort, or Liebig's cooler, may be connected with smaller glass tubes by drawing the nipple over the mouth and inserting the smaller glass

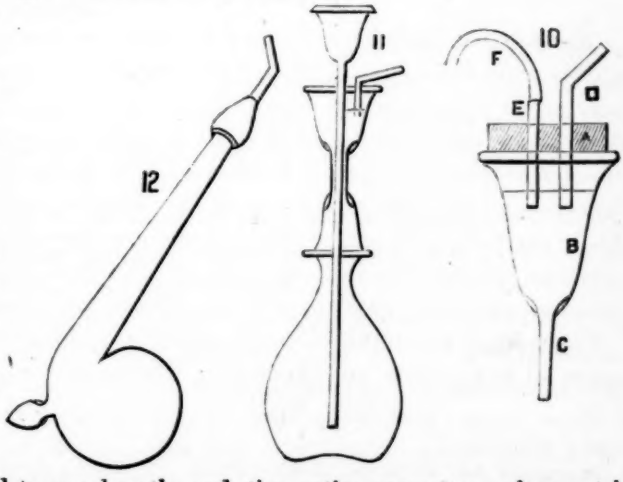
tubing in the opening at the top, as in Figs. 7, 8, 9. Perforated corks are troublesome to make, the filing consuming a great deal of time; but in using the nipple all this is avoided.

5. For *luting corks* on tubulated retorts, as in Fig. 12. Instead of using linseed meal, fenugreek or plaster of Paris, nipples or rubber finger-cots are very convenient, as also for preventing volatile chemicals, such as chlorine water, sulphurous acid and bisulphide of carbon, chloroform, ether, etc., from evaporating, after the bottles have once been opened for dispensing.



6. For constructing a *syphon* (Fig. 10), we take a doubly perforated cork, *a*, draw a nipple, *b*, over one end and a short glass tube, *c*, through the top hole of the nipple, then introduce the bent glass tube, *d*, for suction, and the short straight glass tube, *e*, and attach the rubber tubbing, *f*. This completes the apparatus. In using it, close orifice of *c* with finger and suck at *d*, then at *c*.

My siphon has great advantages over the glass syphon. It can be made without great expense, is not so liable to break, can be easily taken apart and cleaned, the rubber tubing can be extended to any length, and the entire apparatus, when not in



use, can be placed aside in a small box. It is useful for drawing liquors from barrels, for washing precipitates, in preparing deod. tinct. of opium, etc.

7. The nipple can be used where the small neck of a Florence flask does not allow a double perforation, as in Fig. 11. Draw one nipple over the neck, and the other nipple over the doubly perforated cork, and connect both nipples with a short wide glass tube, flanged at both ends. In all cases the top hole of the nipple should be carefully enlarged, to enclose the glass tube firmly, and nipples with one perforation only should be used.

8. A very convenient *pencil eraser*. Put the brown nipple, which I found to be best, over the third finger of your right hand and hold the pencil as usual, and you will be quite astonished at the convenience. You will never again run about the store to look for your eraser.

9. As a *medicine-dropper*. Attach a pointed glass tube to the top of the nipple and draw over the bottle containing the medicine (Fig. 2). In using, squeeze the nipple. In the same way, it can be used as a sprinkler to wash small precipitates on the filter.

10. Cover for alcohol lamp.—*Phar. and Chem.*, Jan., 1881.

THE BOROCITRATES AND THEIR PREPARATION.[1]

By Edmund Scheibe.

Magnesium Borocitrates.—Of all the compounds of borocitric acid the most interesting is the salt of magnesium, since it was successfully used therapeutically more than forty years ago by Graeger, Beckert[2] and other physicians in cases of kidney disease and stone. A subsequent treatise ("Archiv d. Pharmacie" (1866), cxxvii, 256) upon the action of magnesium borocitrate in calculous disorders attributed this to the boric acid, which does not undergo any change through the secretions of the human body, and is, therefore, able to exercise a decomposing action upon the salts of uric and phosphoric acids.

The correctness of this theory is said to be confirmed by the experiments of the author and Madsen ("Pharmaceutische Zeitschrift f.

[1] From a paper published in the "Pharmaceutische Zeitschrift f. Russland," xix, 514.

[2] Magnesia usta, 30 parts; Acid. boracic., 100 parts; Acid. citric., 60 parts; Acid. hydrochloric. (sp. gr. 1·124), 30 parts.

Russland," xix, 239). Madsen found by comparative experiments upon the solubility of uric calculus in solutions of lithium benzoate and magnesium borocitrate that the latter salt is capable of dissolving almost twice the quantity of urate that the lithium compound can. Further, when a small dose (1 gram) of the sodium or magnesium salt was administered, the author, after several hours, succeeded in detecting boracic acid in the urine by the flame reaction. In this case, in order to prevent the volatilization of the boric acid during the concentration of the urine, the operation was conducted in the presence of excess of potash or soda solution.

As to whether, when, after administration, the boric acid occurs in the urine it is combined with bases or free, the author thinks that the following experiment shows that it occurs in both conditions. After the use of larger doses of the magnesium and sodium compounds (10 to 15 grams of the mono-, di- and triborocitrates) the urine was evaporated to perfect dryness and then extracted with absolute alcohol. Boric acid could be detected by the flame reaction both in the alcohol and the residue. Pure boric acid is soluble in alcohol; the boric salts, on the contrary, are not.

Further according to some experiments carried out by N. Schwartz ("Sitzungsbericht d. Dorpater Naturforscher-Gesellschaft" (1879), p. 204), magnesium borocitrate appears to be a stronger antiseptic against bacteria than pure boric acid, and indeed he proved the acid salts (those having the least proportion of boric acid) to have a more energetic action than the neutral salt.

According to Schwartz's observations the mono- and diborocitrates of magnesium appear to decompose in the presence of bacteria and ferments, and the author thinks that it may be assumed that in this case the energetic action depends upon the boric acid set free from the compound *in statu nascendi*.

The acid salts have also the advantage that in comparison with the triborocitrates their taste is more agreeable and they are more soluble in water. For these reasons the author considers the mono- and diborocitrates to be preferable to the neutral salts for therapeutic use. As will appear by analysis reported further on, the preparations most frequently occurring in commerce and found by him in pharmacies, are also acid salts.

Like the salts of the fixed alkalies and alkaline earths there exist three chemically constant compounds of the magnesium borocitrates.

By the solution in boiling water of the constituents according to the following proportions by weight these salts can be easily obtained. As with the exception of the potassium compound the borocitrates crystallize badly or mostly not at all, the preparations are produced in scales or more suitably in the powder form.

The following are the proportions by weight given by the author:

a. Magnesium Triborocitrate $(C_6H_5O_7)_2Mg_3+(B_3H_3O_6)_2$. — Crystallized boric acid, 35 parts; carbonate of magnesium, 25 parts, or calcined magnesia, 12 parts; crystallized citric acid, 42 parts.

b. Magnesium Diborocitrate $(C_6H_6O_7)_2Mg_2 + (B_2H_2O_4)_2$.—Crystallized boric acid, 24 parts; carbonate of magnesium, 16 parts, or calcined magnesia, 8 parts; crystallized citric acid, 42 parts.

c. Magnesium Monoborocitrate $(C_6H_7O_7)_2Mg + (BHO_2)_2$.—Crystallized boric acid, 24 parts; carbonate of magnesium, 16 parts, or calcined magnesia, 8 parts; crystallized citric acid, 80 parts.

Two preparations, which have already been used in therapeutics, have been analyzed by the author. The first, obtained from Opperman's pharmacy in Revel, has been prepared during many years from an old prescription. The powder is soluble in 20 parts of cold water, but less soluble in hot water, and after cooling there is a separation of crystals of boric acid. The taste is strongly acid, and in composition it stands nearest to the monoborocitrates, but it contains more boric acid than can become chemically combined. The mean percentage composition was: citric acid, 61·64; magnesium, 6·23; boric acid, 32·13.

The second preparation, also from the above pharmacy, was obtained from Schering, of Berlin. The beautiful silky scales are soluble in equal parts of cold water. According to the proportions of the citric acid and magnesium it might be described as a diborocitrate, but for this it contains somewhat too little boric acid. It consists of citric acid 73·50 per cent.; magnesium, 8·83 per cent.; boric acid, 16·67 per cent.

Lithium Borocitrates.—All three lithium compounds are easily soluble in water, and what was stated respecting the preparation of the magnesium salts applies equally to them. As a starting point of the preparation carbonate of lithium is the most suitable.

Lithium Triborocitrate $(C_6H_5Li_3O_7 + B_3H_3O_6)$.—Crystallized citric acid, 20 parts; lithium carbonate, 11 parts; crystallized boric acid, 18 parts.

b. Lithium Diborocitrate $(C_6H_4Li_2(BO)_2O_7) + 2H_2O$.—Crystallized

citric acid, 20 parts; lithium carbonate, 7 parts; crystallized boric acid, 12 parts.

c. Lithium Monoborocitrate ($C_6H_6Li(BO)O_7$) + H_2O.—Crystallized citric acid, 20 parts; lithium carbonate, 4 parts; crystallized boric acid, 6 parts.

SODIUM BOROCITRATES.—The normal salt of sodium and both acid salts are obtained by decomposition of crystallized sodium carbonate.

a. Sodium Triborocitrate ($C_6H_5Na_3O_7 + B_3H_3O_6$), etc.—Crystallized citric acid, 21 parts; crystallized sodium carbonate, 42 parts; crystallized boric acid, 18 parts.

b. Sodium Diborocitrate.—Citric acid, 20 parts; sodium carbonate, 28 parts; boric acid, 12 parts.

c. Sodium Monoborocitrate.—Citric acid, 20 parts; sodium carbonate, 14 parts; boric acid, 6 parts.

A sodium compound prepared by Schering, of Berlin, occurs as a light powder, easily soluble in water, having an agreeable acid taste, and in its composition standing nearest to the monoborocitrate. An analysis gave the following percentage composition: citric acid, 80·15; sodium, 8·77; boric acid, 11·08.

AMMONIUM BOROCITRATES.—The ammonium salts are most suitably prepared from the ammonium carbonate. The compounds must be carefully dried, since otherwise decomposition gradually takes place, ammonia being volatilized.

a. Ammonium Triborocitrate $C_6H_5(NH_4)_3O_7 + B_3H_3O_6$, etc.—Citric acid, 20 parts; ammonium carbonate, 15 parts; boric acid, 18 parts.

b. Ammonium Diborocitrate.—Citric acid, 20 parts; ammonium carbonate, 10 parts; boric acid, 12 parts.

c. Ammonium Monocarbonate.—Citric acid, 20 parts; ammonium carbonate, 5 parts; boric acid, 6 parts.

A preparation made by Schrenk, in Darmstadt, has almost the same composition as the normal ammonium triborocitrate. It consists of citric acid, 51·38 per cent.; ammonium (NH_4), 14 per cent.; boric acid, 34·62 per cent.

POTASSIUM BOROCITRATES.—The potassium compounds have up to the present time found scarcely any therapeutic use, but are, as for instance, the crystalline potassium biborocitrate,—of greater theoretic value. In this case the mono- or bicarbonate of potassium are best used in the preparation.

a. Potassium Triborocitrate ($C_6H_5K_3O_7 + B_3H_3O_6$), etc.—Citric

acid, 20 parts; potassium bicarbonate, 30 parts, or monocarbonate, 20 parts; boric acid, 18 parts.

b. Potassium Diborocitrate.—Citric acid, 20 parts; potassium bicarbonate, 20 parts, or monocarbonate, 14 parts; boric acid, 12 parts.

c. Potassium Monoborocitrate.—Citric acid, 20 parts; potassium bicarbonate, 10 parts, or monocarbonate, 7 parts; boric acid, 6 parts.

IRON BOROCITRATES.—Numerous experiments and analyses show that the salts of the heavy metals are wanting in the power to combine chemically citric and boric acids; permanent compounds of constant composition exist only in double compounds with the fixed alkalies. The iron preparation was made by dissolving freshly precipitated oxyhydrate of iron in the acid borocitrates. The amount of iron oxide taken up amounted in the diborocitrate of sodium and iron oxide to almost 8 per cent., and in the monoborocitrate to over 16 per cent.—*Pharm. Jour. and Trans.*, Nov. 13, 1880.

BEHAVIOR OF THE CINCHONA ALKALOIDS WITH POTASSIUM PERMANGANATE.

BY S. HOOGEWERFF AND W. A. v. DORP.

Quinia, cinchonia, quinidia and cinchonidia, when oxidized by permanganate, yield tricarbopyridinic acid together with ammonia, oxalic and carbonic acids, and some other products which need further examination. A dicarboxylic acid, identical with Weidel's cinchomeronic acid, is easily obtained from the tricarboxylic acid. A monocarboxylic acid has also been prepared, but not fully investigated.

Preparation of Tricarbopyridinic Acid.—The alkaloids or their sulphates are mixed with potash solution and heated to boiling in a flask in a calcium chloride bath. The permanganate is added in small quantities until the red color imparted by it remains permanent after an hour's boiling.

After addition of nitric acid and concentration of the solution the potassium is removed by crystallization as potassium nitrate. Barium nitrate is then added as long as a precipitate is formed. This precipitate, consisting of barium oxalate and tricarbopyridinate, is decomposed by sulphuric acid.

Tricarbopyridinic acid forms transparent tabular crystals, which appear greenish by reflected light, and exhibit a strong play of colors

under polarization. It is moderately soluble in alcohol and very sparingly so in ether and benzin, but dissolves readily in boiling water. It gives a faint red color with ferrous salts. It gives up its water of crystallization between 100 and 120° without decomposition, but becomes blackened at 190°, and melts at 244 to 250°. The aqueous solution gives an amorphous precipitate with barium acetate; with calcium acetate a warty crystalline mass of needles; with silver nitrate an amorphous precipitate, which becomes crystalline after a time, and is not much altered by exposure to light; with copper acetate a bright blue amorphous precipitate; with lead acetate (and also the basic acetate) white amorphous precipitates. No red fumes are evolved when the acid is boiled with concentrated nitric acid. It is readily acted on by permanganate in acid, but not in alkaline solutions. It consists in the anhydrous state of $C_8H_5NO_6$, and is tribasic. It crystallizes from aqueous solutions with $1\frac{1}{2}$ mol. of water. The neutral *potassium salt*, $C_8H_2K_3NO_6+3H_2O$, forms brilliant plates, which exhibit a fine play of color in polarized light. The neutral *barium salt*, when prepared by addition of barium acetate to a solution neutralized with ammonia, contains (if precipitated in the cold) 8 molecules of water, and loses $7H_2O$ at 100°, and all its water at 280 to 300°. If the barium acetate is added to an acid solution another salt containing, when dried in air, only $6H_2O$ is obtained, in addition to the one just described. The *calcium salt* contains $7H_2O$. The *normal silver salt*, $C_8H_2Ag_3NO_6+2H_2O$, consists of an amorphous precipitate, which loses part of its water over sulphuric acid, and is not much altered by exposure to light. It is obtained by adding silver nitrate to a solution of the acid neutralized by ammonia. If the aqueous solution of the acid is mixed with silver nitrate a precipitate is thrown down, which is at first amorphous, afterwards crystalline, and which consists of $C_8H_3Ag_2NO_6+H_2O$. Another silver salt, $C_8H_4AgNO_6+C_8H_5NO_6$, crystallizing with $2\frac{1}{2}H_2O$, may be obtained by dissolving the neutral silver salt in warm dilute nitric acid and concentrating the solution.

Cinchomeronic acid may be obtained by heating tricarbopyridinic acid to 180 to 190°, when decomposition takes place, in accordance with the equation, $C_8H_5NO_6=C_7H_5NO_4+CO_2$. This acid is identical with the one Weidel and Schmidt ("Annalen," clxxiii, 96) obtained by direct oxidation of quinia, cinchonia and cinchonidia. It is sparingly soluble in ordinary solvents. It gives no color when mixed with ferrous sulphate. It contains no water of crystallization, and melts at 250°

with evolution of carbonic anhydride, but without being blackened. When distilled with excess of calcium hydrate the distillate smells strongly of pyridine. The *normal barium salt*, $C_7H_3BaNO_4$, forms tufts of needles, which are sparingly soluble. The *normal calcium salt* crystallizes in large prisms, and is more easily soluble than the barium salt; when dried in air it retains $3\frac{1}{2}H_2O$. The *normal silver salt*, $C_7H_3Ag_2NO_4$, is anhydrous, and not much altered by exposure to light. The *acid silver salt*, $C_7H_4AgNO_4$, is obtained by dissolving the acid in boiling water, with addition of a few drops of nitric acid, and adding silver nitrate. It is crystalline and anhydrous. The *normal copper salt*, $C_7H_3CuNO_4+4H_2O$, forms dark blue sparingly soluble crystals. It loses its water of crystallization at 180°.

Cinchomeronic acid splits up on heating into pyrocinchomeronic acid ("Ber.," xiii, 61) and nicotinic acid, whilst carbonic anhydride is evolved.

The action of permanganate on the four cinchona alkaloids seems to be as follows: In the first stage, the molecules containing two nitrogen atoms are split into two groups, containing one atom of nitrogen in each. In the second stage, the nitrogen of one of these groups is evolved as ammonia, while from the other several bodies containing nitrogen are obtained, among the rest tricarbopyridinic acid.

The authors do not agree with Weidel and Herzig's supposition that cinchomeronic acid is constituted (according to Körner's pyridin and quinolin formula) as 1 . 2 . 3, the nitrogen having the place 1; but they assign this constitution to their quinolic acid obtained by the action of permanganate on quinolin, and which they consider to be the normal oxidation product of this body.—*Jour. Chem. Soc.*, Dec. 1880, from *Liebig's Annalen*.

Homatropia Hydrobromate.—Dr. Fronmüller reports in "Allg. Medic. Central Zeitung" a number of experiments, by hypodermic and internal use, made for the purpose of ascertaining the dose producing the first symptoms of intoxication, which appeared on taking in a day 12 pills (three times 4 pills), each containing 5 milligrams ($\frac{1}{13}$ grain) of the salt. The symptoms were dryness and irritation in the throat, congestion of the head and light vertigo. The pulse was rather variable, in some cases unchanged, while in others it was lessened or more frequent.

Researches on the Alkaloids of Jaborandi Leaves.

By E. Hamack and H Meyer.

In addition to pilocarpin, the authors have obtained a second alkoloid from the leaves of jaborandi (*Pilocarpus pennatifolius*), for which they propose the name of "jaborin." The separation of the two alkaloids depends on the facts that free jaborin is more easily soluble in ether and more sparingly soluble in water than pilocarpin, and its platinochloride more soluble in alcohol than that of the latter alkaloid; also that the compounds of jaborin do not crystallize.

The presence of minute quantities of jaborin in pilocarpin is most easily detected by its action on a frog's heart, since jaborin exactly resembles atropin in this respect.

From analyses of pilocarpin aurochloride and platinochloride the authors assign to the free base the composition indicated by the formula $C_{11}H_{16}N_2O_2$.

A curious fact was observed with regard to its aurochloride. When pilocarpin chloride is mixed with gold chloride, a crystalline precipitate is obtained consisting of $C_{11}H_{16}N_2O_2HCl + AuCl_3$. If this is dissolved in alcohol and boiled for a time, a crystalline salt having the composition $C_{11}H_{16}N_2O_2 + AuCl_3$, separates on cooling.

The authors are inclined to class pilocarpin among tertiary diamines. Since the physiological action of pilocarpin is analogous to that of nicotin, experiments (which proved unsuccessful) were made to ascertain if there were any relation between its composition and that of nicotin, $C_{10}H_{14}N_2$. Pilocarpin might, for example, be regarded as a methyl substitution-product of nicotin, thus:

$$C_{10}H_{11}(CH_3)(HO)_2N_2 = C_{11}H_{16}N_2O_2.$$

This view is supported by the fact that jaborandi leaves yield pyridin bases among other products of their decomposition, and nicotin does the same.

Trimethylamin is formed during the dry distillation of pure pilocarpin with excess of alkali, but no coniin. Also when crude pilocarpin was distilled alone no coniin could be detected, but when distilled at 160° with excess of alkali small quantities of a body identical with coniin are formed, as stated by Poehl ("Ber.," xii, 2185), due probably to some products of decomposition, possibly of jaborin.

Preparation of Jaborin.—The crude product (commercial preparation of pilocarpin, etc.) dissolved in alcohol is submitted to fractional

precipitation with an alcoholic solution of platinum chloride. The first part of the precipitate which forms a hard mass, insoluble in water, is removed; the decanted liquid is again precipitated and filtered, and the solution then fully precipitated. After filtration from the precipitate, the jaborin platinochloride separates from the alcoholic solution. The salt, together with the third precipitate, is extracted with hot water and the filtrate concentrated by evaporation over sulphuric acid in a vacuum. Jaborin platinochloride is a bright yellow powder or a dark-red amorphous crumbling mass. The deeper color is due to impurities, which can be partly removed by washing with alcohol. Another method of obtaining tolerably pure jaborin is to mix the aqueous solution of the crude substance with hydrochloric acid, filter, and add mercuric chloride until a precipitate forms. On shaking and filtering, a bright yellow liquid is obtained: sulphuretted hydrogen is added to remove the mercury, and the concentrated liquid is mixed with soda solution and shaken up with ether. On evaporation, jaborin is left as a clear colorless amorphous body. Jaborin is a very strong base, which differs from pilocarpin, especially in its sparing solubility in water and more ready solubility in ether. Its salts are soluble in water and alcohol, and do not crystallize. Free jaborin volatilizes with difficulty at high temperatures. It probably belongs to the tertiary amines. The composition of jaborin is either identical with that of pilocarpin, or their empirical formulæ are closely related. It is probably contained in small quantities, together with pilocarpin, in the leaves of the plant.—*Jour. Chem. Soc.*, Dec., 1880, from *Annalen.*

ON WALDIVIN AND CEDRIN.

By Ch. Tanret.

Translated from "Bull. général de Thérapeutique" (Tome xcix, 1880, pp. 504 to 506), by Fred. B. Power.

The *Simaba waldivia* (Simarubaceæ) grows in Columbia, where it is sometimes, but wrongly, confounded with a tree of the same family, the *Simaba cedron.* Its fruit, which possesses an extreme bitterness, shares with that of the latter the reputation of the remarkable properties which have been attributed to the cedron in the republics of the equator, and of which several travelers have already spoken to the academy. At the request of Mr. Dujardin-Beaumetz, who was desirous of studying the physiological and therapeutical action of it, the author has isolated the two active principles of the two fruits, which

were obligingly furnished him by Mr. Restrepo. Only that of the waldivia was obtained crystalline, and this is now called *waldivin.*

Preparation.—The finely-powdered waldivia is extracted with alcohol of 70 per cent., and then distilled. The residue while still warm is agitated with a large quantity of chloroform, which takes up the waldivin, and the carefully separated chloroformic liquid is then distilled to dryness, the latter residue, when taken up again with boiling water, separates, on cooling, the waldivin in crystals. The yield is very variable, according to the fruits; thus from 1 part to 1000, of badly preserved fruits, it may amount to as much as 8 from recent and dry waldivias.

Composition.—The crystals of waldivin contain water of crystallization, and their composition may be represented by the formula $C_{36}H_{24}O_{20}.5H_2O$. When heated to 110°C. they lose 10 per cent., and the formula requires 9·8 per cent.; on the other hand, the analysis of the anhydrous body has given the following results:

	Found.		Calculated for $C_{36}H_{24}O_{20}$
	I.	II.	
C	54·40	54·2	54·
H	6·22	6·3	6·
O	39·38	39·5	40·
	100·00	100·0	100·

Physical Properties.—The waldivin crystallizes in hexagonal prisms, terminated by a double hexagonal pyramid; it has the specific gravity 1·46, and when heated loses its water of crystallization, then melted at about 230°C. it becomes colored, but is not volatile, and possesses no rotatory power. It is very sparingly soluble in cold water (600 parts at 15°C.), but dissolves in 30 parts of boiling water, acids and salts increasing its solubility considerably, and its aqueous solutions froth strongly upon agitation; it dissolves in 60 parts of 70 per cent. alcohol at 15°C., but requires 190 parts of absolute alcohol. Chloroform dissolves it abundantly, but it is insoluble in ether. It possesses an extreme bitterness.

Chemical Properties.—The waldivin is neutral, its aqueous solutions are precipitated by tannin, and by ammoniacal acetate of lead; the neutral and basic acetates of lead do not precipitate it. In the cold, sulphuric and nitric acids dissolve it without appearing to produce any sensible alteration, the solutions not being precipitated on the addition of water; but if the solutions be neutralized by means of an

alkaline bicarbonate, and if the salt formed is not in sufficiently large quantity to hold it in solution, the waldivin is partially deposited.

The most remarkable property of the waldivin is the facility with which it is decomposed by alkalies; with caustic alkalies the loss of its bitterness is almost instantaneous; with ammonia and the alkaline carbonates the decomposition is less rapid, particularly in the cold, and still less rapid with the bicarbonates.

At the same time that the bitterness of the waldivin disappears the liquid becomes colored deeply yellow, and is again decolorized when acidified. The solution, which contains the products of the decomposition of the waldivin reduces Fehling's solution, and deviates the plane of polarization to the right, but, not being able to produce fermentation, the formation of glucose cannot be affirmed.

In 1851, Lewy extracted from cedron a bitter crystallizable principle, which he called cedrin, and of which he described very summarily the preparation, and indicated some of its properties. Since that time, Cloez has taken up the study ("Ann. des Sciences Naturelles"), but could not obtain the cedrin, the author also having not been able to obtain the bitter principle in a crystallized state, which he has extracted from the fruits of *Simaba cedron*. As there can be no doubt that Lewy was in possession of the true cedron, the author admits, in explanation of these contradictory results, that the fruits that the former had treated could have been mixed with those of the waldivia, and that it was thus the latter which had furnished the crystals which he had obtained.[1]

Cedrin.—The cedron contains more than one-tenth of its weight of fatty matter, which is quite soluble in alcohol, and from which it follows that the process given for the extraction of waldivin must be slightly modified. The powdered cedron is treated with water at 50°C., then heated to boiling to coagulate the albumin, filtered and agitated with chloroform. The latter is distilled to dryness, and the residue again taken up with water, when, on evaporation of the aqueous solution, the cedrin is obtained in the form of a yellow varnish, without the least trace of crystallization.

[1] Lewy cites indeed in the text the *Simaba cedron*. At the end of his note, Dumas has added that a traveler, Saillard of Besançon, had just brought a certain quantity of cedrons, which could serve for chemical and therapeutical experiments. Now, the last cotyledon of the fruits which remained from those brought from America by his father has been confided to him by Dr. Saillard, and this is a true cedron, not a waldivia.—*Comptes Rendus*, 1851.

The cedrin is very soluble in water, in which it softens before dissolving; its distinctive character is its superb greenish-yellow fluorescence, which is shown even in very dilute solutions. Like the waldivin it is exceedingly bitter; but this is not completely destroyed by alkalies; it is neutral to litmus, but tannin and the reagents for alkaloids form precipitates in its aqueous solution.

In concluding, the author expresses the opinion that this cedrin does not appear to be a body of which the purity may be guaranteed, and that new researches are necessary on the subject.

ON PAPAINE; A NEW CONTRIBUTION TO THE HISTORY OF SOLUBLE FERMENTS.

By Ad. Wurtz.

Translated from "Jour. de Phar. et de Chim.," Jan., 1881, by Frederick B. Power.

The author had established some time ago ("Amer. Jour. Phar.," Nov., 1880, p. 568) that papain, the soluble ferment of Carica papaya, is closely connected with the albuminoid substances, both in its composition and chemical properties; and, the researches having been continued, he is now able to give some details regarding its digestive power, and to express an idea as to its mode of action. In order to appreciate the energy of its digestive power, a product which had been purified by means of subacetate of lead was operated with, and the analysis of which has been previously communicated.

In one experiment 0·1 gram of the papaine was digested with 100 grams of moist fibrin, mixed with 500 cubic centimeters of distilled water, to which some drops of prussic acid were added. At the end of 36 hours the mixture was filtered, and an insoluble residue of dyspeptone collected, weighing when dry 2·5 grams. The peptonic solution, which was precipitated by nitric acid to which 500 grams of alcohol were added, furnished an abundant precipitate of parapeptone, which weighed after drying 8·9 grams, while the alcoholic solution left upon evaporation and drying a brown residue weighing 10·3 grams. This residue, having been taken up again with water, the solution ceased to give a precipitate with nitric acid, and when evaporated left a heavy brown-colored syrup, which deposited crystals; the latter, after being purified by several crystallizations from water, with the addition of animal charcoal, was obtained in the form of colorless crystalline plates, presenting the appearance of leucin.

It results from this experiment that the papaine had dissolved 1,000

times its weight of moist fibrin, of which the largest portion had been transformed into peptone not precipitable by nitric acid, and that, in consequence of the complete hydration of the fibrin, it had even formed a small quantity of a crystallizable amide body, it being known that the same occurs in the process of good peptic digestion.

In another experiment 0·05 gram of the same papaine liquefied 100 grams, that is to say 2,000 times its weight, of moist fibrin, with the exception of a residue of dyspeptone, weighing after drying 4·2 grams; and regarding the latter it may be stated that it is always mixed with some impurities, such as hair, straw, etc.

The energy of this digestive action has inclined me to think that in time the ferment, being of an albuminoid nature, would be able to act upon itself in such a way as to cause its hydration, and experience has verified this prevision. When an aqueous solution of papaine, contained in a sealed tube, is allowed to remain at 50°C. for several weeks, it becomes slightly turbid, and contains then in solution a product more hydrated than the original, as shown by the following experiments.

Three grams of purified papaine, containing, a deduction being made for the ash, C 52·19, H 7·12, N 16·4, were dissolved in 20 cubic centimeters of water and heated for 15 days to 50°C.; the solution became turbid and deposited 0·064 gram of a substance containing 0·007 gram of ash. The filtered solution evaporated *in vacuo*, and precipitated by alcohol, furnished 1·8 gram of colorless papaine, which gave on analysis, deduction being made for the ash, C 51·29, H 7·02. The alcoholic mother liquid furnished 0·65 gram of a residue in which crystals were slowly formed, apparently identical with the crystallized nitrogenous matter separated from the juice of the papaya, and which will be referred to later. 1·5 gram of papaine, already modified by the action of water, was redissolved in 20 cubic centimeters of water and the solution again heated for 15 days to 50°C. The solution precipitated by alcohol then gave a product containing, deduction being made for the ash, C 50·46, 50·42, H 7·38, and the alcoholic mother liquid on evaporation left an uncrystallizable residue weighing 0·16 gram. It is thus seen that by simple digestion with water at 50°C. the composition of the papaine becomes so modified as to cause a decrease of 2 per cent. of carbon.

This conclusion has been strengthened by a new experiment, in which 5 grams of papaine, containing C 51·8, H 7·2, having been heated for two months with 20 cubic centimeters of water at 50°C.,

furnished a papaine containing C 49·8, 50·3, H 7·3, 7·4. At 100°C., the action of water on the papaine is still more pronounced. 4 grams of papaine, dissolved in 45 cubic centimeters of water, were heated in a closed vessel for ten days at 100°C., the liquid depositing 0·084 gram of a precipitate which contained but 0·0015 of ash. Precipitated by alcohol, this solution gave a brown deposit containing, a deduction being made for the ash, C 47·66, H 8·14, and the mother liquor left on evaporation an amorphous residue weighing 1·114 gram. Some experiments may be finally mentioned, which will, perhaps, throw some light on the mode of action of the papaine.

0·3 gram of papaine was dissolved in 50 cubic centimeters of water, and 10 grams of fibrin digested with this solution; at the end of 20 minutes the liquid was expressed and the fibrin subjected to prolonged washing with cold water. In the liquid obtained by the expression of the fibrin a new portion of 15 grams was digested, and at the expiration of half an hour this second portion of fibrin was expressed, and washed as the first. Both portions (the first reduced to 7 grams by the commencement of digestion, the second to 14 grams) were digested at 40°C. with pure water, when both became dissolved, the second leaving a residue of 4 grams of moist dyspeptone.

In these two experiments the washings had certainly removed the dissolved ferment, and the washed fibrin would not have been able to dissolve except by the action of a portion of ferment fixed upon it, or perhaps combined with it; the ferment fixed upon the fibrin in an insoluble state had then redissolved it in consequence of the hydration of the fibrin.

The objection could be made that the ferment is retained by the fibrin in consequence of the difficulty of causing the water to penetrate in the flocks, and in response to this objection the following experiment has been made.

Seventeen grams of fibrin were cut as finely as possible with the scissors, then put in contact with a weak solution of papaine for ten minutes at ordinary temperatures, then expressed and washed for half an hour under a strong stream of water; finally, ten times in succession, and with expression, with distilled water. The last wash water, put in contact at 40°C. with the fibrin, did not dissolve from one day to the next the least trace of these substances. The fibrin thus treated and washed was digested at 40°C. with 75 cubic centimeters of pure water, when the following day the solution was complete, with the exception of a residue of 0·17 gram of dry dyspeptone.

It is, then, established that the papaine commences by fixing itself upon the fibrin, and that the insoluble product, perhaps a combination of the fibrin and the papaine, gives by the action of water the soluble products of hydration of the fibrin, at the same time the ferment being again set free can exercise its action on a new portion of fibrin.

This action will thus be found to recall that of the chemical agents, properly speaking, sulphuric acid, for example, small quantities of which can exercise a hydrating action, in consequence of the ephemeral formation of combinations which are produced and resolved without cessation.

PEPTONE.

By C. A. Pekelharing.

The researches of Plósz, Malay, and Adamkiewicz, the author admits, point to the conclusion that albuminoids, although changed by the digestive fluids into peptones, resume after absorptioon their original properties, and further, that peptone may be substituted for albuminoids, as a food not only without harm, but with positive advantage to the animal. But it is obvious from the methods of preparation of peptone adopted by these observers, that the word "peptone" has not the clear and definite meaning usually attributed to it. The method used in all these cases was the digestion of fibrin by gastric juice. But the times deemed sufficient by each observer for complete conversion vary widely. Plósz, 2 to 3 weeks; Malay, 2 to 3 days; Adamkiewicz, 2 to 5 hours. Despite these differences, the conclusions arrived at agree in the main, viz., that peptone can replace proteids as food, and that animals so fed will not only maintain, but increase their weight.

After examining these results more in detail, the author remarks on the importance of experimenting with a substance of constant composition, and proceeds to describe his method of preparing pure peptone, which depends on a property described by Place and Huizinga ("Onderzoekingen gedaan in het physiologisch laboratorium der Leidsche Hoogeschool," 1870, and "Maandblad von Naturwetenschappen," 1873, p. 29), viz., that in the cold a solution of peptone, having an acid reaction, is precipitated by neutral salts, the precipitate redissolving on warming.

Fibrin from bullock's blood and egg-albumin was used, and was digested with 0·2 per cent. hydrochloric acid, and pepsin (either com-

mercial or prepared by extracting pig's or dog's gastric mucous membrane in glycerol) for 2 to 5 hours at 40°C. The solution was then neutralized until the reaction was very feebly acid, heated to boiling, and filtered hot. The filtrate after cooling, usually opaslescent or distinctly cloudy, was evaporated a little, made strongly acid with acetic acid, and saturated with sodium chloride. The somewhat abundant flocculent precipitate so produced was filtered off, after 8 to 12 hours. The fluid, which filters readily, passes perfectly clear through the paper, and the precipitate dissolves very readily in distilled water on warming, still not without a slight flocculent cloudiness, due to albumin which has not been completely precipitated by boiling in a feebly acid solution, but when precipitated by sodium chloride and acetic acid, is not soluble on heating. If the precipitate is dissolved in a sufficiency of water, the fluid, when separated from the albuminoid precipitate, is perfectly clear; if, however, the distilled water be spared, with the idea of avoiding a large mass of fluid, the precipitate will return on cooling. The solution is then to be dialyzed, in order to get rid of the acetic acid and sodium chloride; in one day, a precipitate of peptone is formed, which continually increases as the dialysis is pushed, and which on warming, or the addition of small quantities of acid, alkali or salts, is completely dissolved. After three or four days' dialysis, the fluid is nearly free from salts, and the precipitate may be removed from the dialyser, boiled in water, and the resulting solution, which is not quite clear, filtered hot. The filtrate is a pure peptone solution, and will yield a heavy precipitate on cooling. It is to be concentrated at a gentle heat, and finally dried in a vacuum over sulphuric acid. When dry, peptone so prepared is a pure white powder, and is not hygroscopic. It has the following properties:

Heated over a flame, it does not melt, but forms strong tenacious bubbles. The ash is small; the substance heated at 105° gave 0·4 per cent. and 0·47 per cent. ash.

The powder is only partially soluble in cold water, but dissolves completely on warming, separating again as the solution cools. The solution has a perfectly neutral reaction.

Addition of a small quantity of sodium chloride will prevent precipitation on cooling; added in excess, however, it causes a slight turbidity in the cold, which disappears on warming.

Very small quantities of acids or alkalies will cause solution in the cold. Peptone is precipitated from the alkaline solution by sodium chloride in excess; this does not occur, however, if the peptone is

warmed in the acid solution, provided the acid is not present in too small quantity, and has acted thoroughly (this is best effected by warming); saturation with sodium chloride to the extent of 4 per cent. gives a precipitate, which completely disappears on heating. The same takes place if more salt is added. When 16 per cent. of salt has been exceeded, complete solution only occurs when the peptone solution is somewhat dilute. Peptone is precipitated from the feebly acid or alkaline solution by neutralization; if, however, too much acid or alkali has been used for solution, sufficient salt may be formed to hinder precipitation. Strong nitric acid gives a precipitate, which vanishes on heating, before the yellow coloration appears, and returns on cooling. Silver nitrate added to a solution of peptone which is cooling, and therefore is becoming cloudy, increases the cloudiness. The precipitate disappears almost entirely on cooling; a slight opalescence, due to sodium chloride, alone remaining. The precipitate produced by silver nitrate is soluble in acetic acid.

Absolute alcohol precipitates peptone in neutral, but not in acid or alkaline solution. Potassium ferrocyanide and acetic acid give a voluminous precipitate, soluble on heating.

Basic lead acetate, with ammonia, tannic and phosphomolybdic acids, give precipitates which are not soluble on heating.

The precipitate yielded by Millon's reagent dissolves with a red color, if only small quantities of the mercury solution are used. More of the reagent gives a red precipitate, permanent on heating; cupric sulphate, ferric acetate, ferric sulphate, lead acetate and basic lead acetate do not precipitate the peptone solution, unless sodium chloride or potassic acetate is present.

The author then proceeds to say that from these reactions no albumin can be present. Peptones from fibrin or albumin or other sources resemble one another in all their chemical properties. All are lævorotatory, but there is some difference in the degree of rotation, albumin peptone having the least, and casein peptone the greatest, effect on polarized light.

No elementary analysis was made by the author. The question whether peptone is isomeric with albumin, or differs from it by one or more molecules of water, is then raised, and the experiments of Huizinga and others on the subject criticized at great length. With the view of showing that these observers did not use a pure material, Meissner's peptones are examined with the same conclusion.—*Jour. Chem. Soc., Dec.* 1880, from *Pflüger's Archiv.*

Manufacture of Quinia in the United States.—An article in the New York "Times" of January 13, which has evidently been written by one well informed on the subject, refers to the price of quinia which last year averaged $2.90, the maximum figure being $3.25, the minimum $2.50. This is about equal to the quotations between 1873 and 1876, previous to the removal of duty from quinia. All articles essential for the manufacture of quinia are taxed, such as soda, fusel oil, alcohol; by our navigation laws, the valuable barks from the East Indian plantations are diverted to Europe, a discriminating duty of 10 per cent. being imposed upon them here. American manufacturers are thus compelled to use barks very poor in quinia, but richer in cinchonidia, which latter alkaloid is protected by a duty of 40 per cent. Prior to 1879, about 900,000 ounces of quinia sulphate was manufactured in the United States; last year it was not over 500,000 ounces. The largest quinia manufactory is stated to be at Milan, Italy, carried on by a joint stock company, which supplies under contract East India and Russia, and produces annually about 1,200,000 ounces or about one-third of the entire consumption of the world. J. M. M.

Georgia Bark.—In an article of the New York "Times" referred to elsewhere (see above) the importance of making systematic experiments for cultivating different species of cinchona in the United States is discussed, and it is stated that there exists a "pseudo-cinchona" tree in Georgia. The tree alluded to is undoubtedly the one called "Georgia bark" in Porcher's Resources of the Southern Fields and Forests. This is the *Pinckneya pubens* of Michaux, ord. Rubiaceæ, subord. Cinchonæ which is found on riverbanks and in swampy locations from South Carolina southward to Florida. Under cultivation it usually branches from the base, but in its native localities it is a beautiful tree 20 feet or more in height, with large opposite ovate and acute leaves and with downy cymes of purple-colored flowers, which are radiant by the expansion of a calyx segment of the marginal flowers.

Michaux reported the bark to be useful in intermittent fever, and more recently, Dr. Law, of Georgia, and Dr. Fauntleroi, of Virginia, corroborated this statement. The latter considers it too slow in its action to be used as a substitute for quinia, but as deserving a position in the front ranks of vegetable tonics; it usually produces diaphoresis. The bark is given in the form of powder or of decoction in the dose of about one drachm. Dr. Farr is said to have detected a considerable amount of *cinchonia* in it, which statement is, probably, not correct,

though the substance obtained may have been an alkaloid. It will be remembered that many plants of this order owe their properties chiefly to alkaloids. J. M. M.

VARIETIES.

COLOR TESTS OF COAL TAR DYES.—In a paper read before the chemical section of the British Association, at their recent Swansea meeting, Mr. John Spiller, F.C.S., recommends the following:

If the body under examination be dissolved in strong oil of vitriol a color test is at hand whereby useful inferences may be derived as to the nature of the dye, and often its exact identity disclosed. A few direct confirmatory tests may then be applied. The most remarkable color reactions are the following:

Magdala (naphthalin pink),	Blue black.
Saffranin,	Grass green, becoming indigo blue on strongly heating.
Crysöidin,	Deep orange, turning almost to scarlet on heating.
Alizarin,	Ruby-red or maroon.
Eosin,	Golden yellow.
Primrose (naphthalin yellow),	Difficultly soluble, first yellow, and color discharged on heating.
Crysanilin,	Yellow or brown solution, of marked fluorescent character.
Aurin,	Yellowish brown, non-fluorescent.
Atlas orange,	Rose color, turning to scarlet on heating.
Atlas scarlet,	Scarlet solution, very permanent on heating.
Biebrich scarlet, R,	Blue-black or deep purple.
" " B,	Bluish green.
Anilin scarlet,	Golden yellow, permanent on heating.
Indulin,	Slatey blue to indigo, according to shade of the dye.
Rosanilin, regina and all violets,	Yellow or brownish yellow.
Phenyl and diphenylamin blues,	Dark brown solutions.
Iodine green, Malachite green,	Bright yellow solutions, the former giving off iodine on heating.
Citronin,	Pale cinnamon or neutral tint.

After vitriol, the action of concentrated hydrochloric acid may be next tried, which distinguishes at once between saffranin and Biebrich scarlet, the former giving a violet solution and the latter being precipitated as a red flocculent powder.

Proceeding in this way, and combining the observation with the dyer's usual test, every one of the substances named can be readily identified, and much time saved in the examination of dye-stuffs.—*Oil and Drug News*, December 21st.

ADMINISTRATION OF PODOPHYLLIN.—Dr. Horace Dobell's formula for the administration of this valuable laxative, is as follows:

℞ Podophilli resinæ, ... gr. ii.
Essentiæ zingiberis, ... ℥ ii.
Spirit. vini rectif., ... ℥ ii.

M. S.—A teaspoonful in a wine-glassful of water every night at bed-time, or every second, third or fourth night, as required.—*St. Louis Clinical Record.*

Pulvis Glycyrrhizæ Compositus.—Dr. E. T. Blackwell proposes the following modified formula:

	In each teaspoonful.
℞ Sennæ pulv., ...	8 grains.
Sulphur. loti, ...	8 "
Sacchari albi, *aa* ℥ss, ...	8 "
Fœniculi pulv., ...	4 "
Glycyrrhizæ pulv., *aa* ℥ii, ...	4 "
M.	In all, 32 grains,—

laxative 16 grains, excipient 16 grains,—an equal proportion.

No one will question, I think, the improvement in bringing the quantity of sulphur to equal that of the senna, which it so much surpasses as a laxative. Nor does it prove less acceptable to the taste, while it is better tolerated by the stomach.—*Med. Times*, Nov. 20th, 1880.

Palatable Quinia.—Dr. E. R. Dodson, of Baltimore, writes to the "Maryland Medical Journal" that he has found the unpleasant taste of quinia largely ameliorated by giving it with Liebig's liquid extract of beef, and that he has been able to administer it in this way in cases where otherwise it was impracticable. He says also that this preparation of beef, taken before the quinia, appears to have a tendency towards preparing the stomach for its reception.—*Chicago Medical Review*, December.

Carbolic Acid in Facial Erysipelas.—Dr. Rothe, for some years past, has been in the habit of using the following application: Acid. carbolic., sp. vini., each one part; ol. terebinth., two parts; tinct. iod., one part; glycerin, five parts; penciling the inflamed skin and its vicinity with it every two hours. No pain or sense of burning is produced, and the skin is usually next day pale and wrinkled. The further progress of the disease is more effectually arrested than by any other remedy, any new patches being rapidly effaced, so that in three or four days the facial erysipelas is usually at an end. The penciled places should be covered by a very thin layer of wadding. When febrile action is present the ordinary internal measures must also be resorted to.—*Louisv. Med. News.*

Perfumed Carbolic Acid.—

℞ Acidi carbol. cryst., ... 1 part.
Olei limonis, ... 3 parts.
Alcoholis (36°), ... 100 " M.

This mixture, which appears to be quite stable, and has only the odor of lemon, is what has been known as "Lebon's Perfumed Carbolic Acid," the formula for which has long been a secret, but has now been made known in the "Moniteur Scientifique," of Paris. The antiseptic properties are in no way affected by the oil of lemon.—*Med. and Surg. Rep.*

CARBOLIC ACID IN PRURIGO.—M. Lallier, of the St. Louis Hospital, Paris, uses in pruriginous affections of the skin a solution of carbolic acid (two per cent.), to which he adds half an ounce of glycerin, as compresses, or, better, in the form of spray. Its anæsthetic properties cannot be contested, and no inconvenience results from its continued use.—*Med. Times.*

OIL OF WINTERGREEN IN PURULENT CYSTITIS.—Dr. Perier, of the St. Antoine Hospital, Paris, regards this oil as a powerful antiseptic irritant, and employs the following combination: ℞ Oil of wintergreen, six grams; tinct. of guillaya saponaria, thirty grams; water, one liter. This forms an excellent fluid for injecting into the bladder, for washing wounds and for some simple dressings.—*Amer. Practitioner*, January.

GLYCEROLE OF THYMOL.—Take of thymol., gr. xx; glycerinæ and alcoholis, each f℥i; aquæ destillatæ ad Oi. Mix. Useful in pityriasis, and, when diluted, as an effective antiseptic mouth-wash.

HOT WATER FOR SWEATY FEET.—In an article in the Ohio "Medical Recorder," Dec., 1880, Dr. Pooley says:

Dr. Gay, of Columbus, informs me that when he was at the Hot Springs, in Arkansas, he saw there what was called the "corn hole," being one of the hot wells for which the region is celebrated, in which numerous persons were in the habit of soaking their feet for many hours every day, until their corns were thoroughly macerated, and could easily be pulled out by the roots. He was told that it also cured sweaty feet, which he found, on inquiry, to be the fact, and since his return home he has cured this affection in many instances, by simply directing the feet to be soaked, for hours every day, in water as hot as can be borne.—*Med. and Surg. Rep.*, Jan. 8.

FETID SWEATING OF THE FEET.—A correspondent of the "British Medical Journal" recommends, in this annoying condition, that the affected portions of the sole of the foot be covered with ordinary adhesive plaster. This should be renewed in three or four days, and again after a week. The fetor ceases from the first application.—*Chicago Med. Review*, January 5.

THE MOVEMENTS OF PLANTS.—Since the time of Linnæus, men have wondered and speculated about what are known as the spontaneous movements of plants, and in recent years the causes of these movements have been carefully investigated by botanists. The subject in its various bearings now forms a large part of the science of vegetable physiology. The periodical and irritable motions of plants, and those due to light and gravity, have been closely studied in connection with the mechanical laws of growth, and many of these phenomena have been more or less satisfactorily explained.

But it has been reserved for Mr. Charles Darwin to go deeper into the facts and philosophy of the subject than any of his contemporaries. In

1875 he published a book upon "The Movements and Habits of Climbing Plants;" and he has since extended his inquiries so as to include the movements manifested by the entire vegetable series, except the lowest flowerless plants, and upon these he is now engaged. He has just published an account of these researches in a volume of six hundred pages, uniform with his other works.—*Eliza A. Youmans, in Popular Science Monthly for February.*

CLOVER TEA FOR CANCER.—A writer in the "Medical News" says: The clover tea has done wonders for me. My appetite is now good, my general health greatly improved, and the wound is healing. For seven months I have had to take morphia, and its unpleasant effects had become great. My pain having so much diminished under the use of the clover tea, and my general health having gotten so much better, I determined to give up the morphia, and have gotten on comfortably without it. If my experience will save one poor suffering fellow creature a single pang such as I have suffered, I will thankfully bear my cross, and rejoice that through me a remedy has been found which will give relief, if not cure, for cancer. The tea should be made as tea is made for table use, strained, and taken before meals and at bedtime, about a quart daily. The blossoms of red clover should be used.

A fluid extract has been made, of which the dose is a tablespoonful thrice daily.—*Va. Medical Monthly.*

ACTINOMERIS HELIANTHOIDES.—The root of actinomeris helianthoides is from the size of a quill to that of a knitting needle, and has an oil and perhaps a resin in it, giving it the taste and somewhat the smell of turpentine. It has long been used by the people of Upper Georgia in dropsy, under the name of diabetes weed. Dr. I. G. M. Goss says that he has used it in several obstinate cases of dropsy and in several cases of chronic cystitis with fine effect; also in calculous affections and in chronic inflammation of the entire urinary tract. He gives it in the form of a tincture, one or two drachms to a dose, as a diuretic, or as an infusion, in doses of one-half to one ounce, repeated every hour or two. It may be tinctured in sweet spirit of nitre, eight to sixteen ounces of nitre.—*New York Med. Jour.*, from *Med. Times*, Nov. 20th.

BELLADONNA JUJUBES.—The influence of belladonna upon the mucous membranes is well known, and hence its value in some forms of irritable bladder and especially in the "nocturnal incontinence" of children, has long been fully recognized ("British Med. Jour."). Now, children do not like medicine, but they do like sweetmeats. Dr. J. Hickinbotham, physician to the Birmingham and Midland Hospital for Women, has, therefore, had made some jujubes of most agreeable flavor, each containing two minims of the pharmacopœial tincture of belladonna. The use of the jujubes will of course not be limited to the cases above described. Dr. Hickinbotham has found them useful in an obstinate "tickling" cough.—*Louisv. Med. News*, December 25th.

ALCOHOL AND DIGESTION.—M. Leven ("Boston Jour. of Chem.") claims that 75 grams of brandy to 200 grams of meat completely arrest digestion, while 25 grams in the same quantity facilitate digestion. Dr. Rabuteau finds ethylic alcohol far less injurious than amylic.—*Ibid.*

MOUNTAIN FEVER, Dr. Alfred Wise, visiting physician to the Infirmary for Consumption, writes, in the "British Med. Jour.," is one of the dangers in the "high-altitude treatment" of phthisis now so fashionable.

PEPTIZED MILK AS FOOD FOR INFANTS AND INVALIDS.—Nunn recommends the following modes of preparing this valuable food: Take one pint of milk at 80°F., add a teaspoonful of rennet solution or 10 grains of pepsin, and keep the mixture at 80°F. When coagulation is complete, but before the whey has begun to separate, beat the whole up smooth with a whisk or beater, and pass through a fine milk-strainer to insure the minute division of the curd. This preparation appears to keep equally as well, or better, than raw milk, remaining apparently unchanged for twenty-four hours if kept cool. Dilute and sweeten for feeding as usual.

By this method coagulation is complete, and no further change of that nature is requisite, the weakened stomach of the invalid receives the necessary nutriment, carrying with it its own digestive principle.—*Buffalo Med. and Surg. Jour.*, Dec., 1880.

WHY WE EAT OYSTERS RAW.—Dr. William Roberts, in his interesting lectures on the digestive ferments, says: "The oyster is almost the only animal substance which we eat habitually, and, by preference, in the raw or uncooked state, and it is interesting to know that there is a sound physiological reason at the bottom of this preference. The fawn-colored mass which constitutes the dainty of the oyster is its liver, and this is little less than a heap of glycogen. Associated with the glycogen, but withheld from actual contact with it during life, is its appropriate digestive ferment—the hepatic diastase. The mere crushing of the dainty between the teeth brings these two bodies together, and the glycogen is at once digested without other help by its own diastase. The oyster in the uncooked state, or merely warmed, is, in fact, self-digestive. But the advantage of this provision is wholly lost by cooking, for the heat employed immediately destroys the associated ferment, and a cooked oyster has to be digested, like any other food, by the eater's own digestive powers."—*Amer. Med. Monthly*, Nov., 1880.

WHAT IS THE NATURAL FOOD OF MAN?—As an abstract truth, the maxim of the physiologist Haller is absolutely unimpeachable: "Our proper nutriment should consist of vegetable and semi-animal substances which can be eaten with relish before their natural taste has been disguised by artificial preparation." For even the most approved modes of grinding, bolting, leavening, cooking, spicing, heating and freezing our food are, strictly speaking, abuses of our digestive organs. It is a fallacy to suppose that hot spices aid the process of digestion: they irritate the

stomach and cause it to discharge the ingesta as rapidly as possible, as it would hasten to rid itself of tartarized antimony or any other poison; but this very precipitation of the gastric functions prevents the formation of healthy chyle. There is an important difference between rapid and thorough digestion. In a similar way, a high temperature of our food facilitates deglutition, but, by dispensing with insalivation and the proper use of our teeth, we make the stomach perform the work of our jaws and salivary glands; in other words, we make our food less digestible. By bolting our flour and extracting the nutritive principle of various liquids, we fall into the opposite error: we try to assist our digestive organs by performing mechanically a part of their proper and legitimate functions. The health of the human system cannot be maintained on concentrated nutriment; even the air we inhale contains azotic gases which must be separated from the life-sustaining principle by the action of our respiratory organs—not by an inorganic process. We cannot breathe pure oxygen. For analogous reasons bran-flour makes better bread than bolted flour; meat and saccharine fruits are healthier than meat-extracts and pure glucose. In short, artificial extracts and compounds are, on the whole, less wholesome than the palatable products of Nature. In the case of bran-flour and certain fruits with a large percentage of wholly innutritious matter, chemistry fails to account for this fact, but biology suggests the mediate cause: the normal type of our physical constitution dates from a period when the digestive organs of our (frugivorous) ancestors adapted themselves to such food—a period compared with whose duration the age of gristmills and made dishes is but of yesterday.—*From Physical Education, by Dr. Felix L. Oswald, in Popular Science Monthly for January.*

Science in Education.—From the time that the first suggestion to introduce physical science into ordinary education was timidly whispered, until now, the advocates of scientific education have met with opposition of two kinds. On the one hand they have been pooh-poohed by the men of business who pride themselves on being the representatives of practicality, while on the other hand they have been excommunicated by the classical scholars, in their capacity of Levites in charge of the ark of culture and monopolists of liberal education. The practical men believed that the idol whom they worship—rule of thumb—has been the source of the past prosperity, and will suffice for the future welfare of the arts and manufactures. They were of opinion that science is speculative rubbish; that theory and practice have nothing to do with one another; and that the scientific habit of mind is an impediment rather than an aid in the conduct of ordinary affairs.

I have used the past tense in speaking of the practical men—for, although they were very formidable thirty years ago, I am not sure that the pure species has not been extirpated. In fact, so far as mere argument goes, they have been subjected to such a *feu d'enfer* that it is a miracle if they have escaped. But I have remarked that your typical practical man has an unexpected resemblance to one of Milton's angels. His spiritual wounds, such as are inflicted by logical weapons, may be as deep as a well and as

wide as a church-door, but, beyond shedding a few drops of ichor, celestial or otherwise, he is no whit the worse. So, if any of these opponents be left, I will not waste time in vain repetition of the demonstrative evidence of the practical value of science; but knowing that a parable will sometimes penetrate where syllogisms fail to effect an entrance, I will offer a story for their consideration.—From *Science and Culture, by Professor Huxley, in Popular Science Monthly for December.*

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, Jan. 18, 1881.

On motion of Prof. Maisch, Mr. E. Gaillard was called to the chair, and the minutes of the last meeting having been read, were approved.

Prof. Maisch presented, on behalf of the British Pharmaceutical Conference, a copy of the Year Book of Pharmacy for 1880, and transactions of the last meeting.

A specimen of *Chian turpentine* from Mr. M. Eisner, manager of the pharmacy formerly conducted by Messrs. John & Cramer and more recently by Messrs. Cramer and Small, was also presented to the cabinet of the College, and Prof. Maisch remarked that this specimen was imported in 1858 by Messrs. John & Cramer from Messrs. Horner & Son, of London, and that its appearance corresponds with the descriptions given in authoritative treatises on materia medica.

Mr. F. L. Slocum, a member of the present senior class, read a paper upon *absorbent cotton* (see p. 53). Prof. Maisch remarked that cotton was usually considered to be nearly pure lignin, yet, under the treatment, described, it lost 10 per cent. of its weight, about one-half of which, at least, appeared to be fat; but, by treating cotton with benzin, ether or similar solvents for fat, little of those compounds seemed to be removed, and the cotton is but slightly improved as to its absorbent qualities by this treatment. Prof. Sadtler directed attention to the fact, that fats are more easily removed by forming a chemical compound, soluble in water, than by simple solvents, and the cause of the difficulty of removing it by the latter from cotton was most likely due to mechanical difficulties obstructing the action of the solvent which would act promptly if cotton was reduced to powder.

Mr. Heinitsh, of Lancaster, and Mr. Lemberger, of Lebanon, being present, were welcomed by the chairman.

Mr. Heinitsh, at the request of Prof. Remington, gave a short account of the *cultivation of saffron* in Lancaster county, where annually about 14 pounds of it are produced; the corms are planted on well-prepared garden soil in June, and while flowering in September the stigmata are pulled, dried in the shade and offered for sale; this was all, but it is much easier told than done, for it required about 50,000 flowers to yield one pound of saffron.

Dr. Wolff made a few remarks relative to the *preparation of oleate of bismuth;* he stated that oxide of bismuth, unless fresh, would not unite

well with oleic acid, and that in view of this he had tried the plan of saponifying oil of almonds and decomposing the soap by crystallized nitrate of bismuth, this does not give a true and pure oleate, but an oleo-palmitate of bismuth. An oleate of zinc may also be prepared in the same manner. His experimennts on this subject are not yet completed.

Mr. L. E. Sayre made some remarks upon the *preparation of pepsin;* in his opinion, the pepsin should be dried thoroughly before being mixed with sugar of milk; if the mixture is made while the pepsin is moist, there seems to be an incipient fermentation induced before the drying has been effected, and the product obtained has less digestive power than pepsin dried by itself and then mixed with milk sugar. In reply to a question as to the amount of acid used in testing the effect upon coagulated albumen, he stated, that the same quantity was used in every experiment, and that any considerable excess of acid was undesirable.

This subject led to some remarks about the milky juice of the *Carica papaya*, which is a solvent for albumen, fibrin and other protein compounds; some of the statements made in the various treatises on botany, like the asserted effects of the exhalations of the tree upon meat, are so extravagant as to be entirely incredible.

Mr. Lemberger regretted that his residence out of the city prevented his more frequent presence at the pharmaceutical meetings, and urged, especially the junior members of the profession, to improve the advantages that their collegiate course here offered them, that they might never reflect unpleasantly on misimproved opportunities.

Prof. Sadtler made some additional remarks on the coloring matter of Beth-a-barra wood; its similarity, in some particulars, to chrysophanic acid had suggested to him an examination which he has since carried forward to some extent, and which exhibits such marked differences in certain peculiarities that entitle it to rank as a distinct and peculiar coloring principle.

There being no further business a motion to adjourn was carried.

T. S. WIEGAND, *Registrar.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

THE PHILADELPHIA COUNTY MEDICAL SOCIETY AND THE COLLEGE OF PHARMACY.—A member of the Medico-Legal Association, of this city, who was active in the conference called by the association with the druggists of this city, appears to have been dissatisfied with the results of the conference, and read before the County Medical Society a lengthy paper, which appears to have been substantially the same as that read by him before the conference.

The subject was referred to a committee of the County Medical Society, and, by their request, the Board of Trustees of the Philadelphia College of Pharmacy appointed a committee of five members to meet them in conference. The committee of the Board of Trustees of the College have made the following report:

The committee appointed to meet in conference a committee of the County Medical Society, by request of said committee of the County Medical Society, to discuss some plan of proceeding to regulate the evil claimed to exist in reference to, 1st, "the renewal of physicians' prescriptions;" 2d, "prescribing by druggists"; 3d, "the sale of proprietary medicines"; 4th, "ordering by physicians of special formulas;" 5th, "the adoption of such additions to the medical and pharmaceutical codes of ethics now existing as will tend to advance the professional rights of the physician and pharmacist in Philadelphia, and maintain mutual respect and consideration of the two professions without ignoring the short-comings of either"—

Respectfully report that a meeting of the two committees was held at the rooms of the County Medical Society, Dec. 10th last.

After a general discussion embracing the merits of the *whole* subject, the divisions of the subject, as detailed above, were taken up *seriatim*.

It was the general impression regarding the vexed question of *ownership* in a prescription, that the decision of a case by a court of competent jurisdiction could alone settle the question to the satisfaction of all concerned; but that, in the absence of a statute law on the subject in Pennsylvania, the long-continued custom of regarding the prescription as the property of the patient could not be disregarded. It was also brought to the notice of the medical profession that it would be difficult to prevent the holder of a prescription from obtaining a copy of the same, and that a *renewal* of the prescription could not be prevented by a decision of ownership adverse to the holder of the *original*. It was therefore the judgment of the joint committee that when physicians desired their prescriptions not to be renewed they should make such a request on the prescription, and, if printed, to sign their name under the *printed* form, to give greater weight to the request.

It was also the judgment of the committee that physicians should instruct their patients regarding the evils which sometimes occur in consequence of continuing a prescription beyond the time intended, without further medical advice being obtained.

"Prescribing by druggists," except in cases of trivial ailments, or where the necessity of the case demanded relief before a physician could be called, was unanimously condemned. The code of ethics of the Philadelphia College of Pharmacy on this subject was read, and, in the judgment of the committee, covered acceptably the question. The code is as follows:

"Sec. 2d. As the diagnosis and treatment of disease belong to the province of a distinct profession, and as a pharmaceutical education does not qualify the graduate for these responsible offices, we should, where it is practicable, refer applicants for medical aid to a regular physician."

"The sale of proprietary medicines." Here, also, the code of ethics of the Philadelphia College of Pharmacy was found to be satisfactory, as follows:

"Whilst the College does not feel at present authorized to require its members to abandon the sale of secret or quack medicines, it earnestly recommends the propriety of discouraging their employment, when called upon for an opinion as to their merits."

"The ordering by physicians of special formulas." The practice of writing prescriptions so as to be understood by some one or two pharmacists alone was stated to be a violation of the ethics of the County Medical Society, and was condemned as unprofessional.

The committee agreed to recommend to the County Medical Society and to the Philadelphia College of Pharmacy that greater publicity among physicians and pharmacists should be given to the codes of ethics of both of these bodies, as tending the better to define the position of the two professions to each other.

The meeting was marked by a pleasant cordiality of feeling, and a mutual desire for a full recognition of the rights of each profession, and the maintenance of a mutual respect and consideration.

ALUMNI ASSOCIATION, PHILADELPHIA COLLEGE OF PHARMACY.—At the social meeting held January 11th Dr. Mitchell delivered a lecture on salicylic acid, referring to its discovery by Piria, Ettling, Löwig, Procter and others, and to the various methods by which it may be obtained. Kolbe's process from sodium phenol by dry carbonic anhydrid and Squibb's method of purifying the acid by sublimation with steam were fully described; the principal tests of identity and purity were performed, and the use of salicylic acid in medicine and surgery discussed.

Mr. Sayre discoursed on the processes for preparing the various officinal alkaloids, following the different steps of exhaustion, isolation and purification in their outlines, and comparing the main features of the different processes with one another.

PHILADELPHIA DRUG EXCHANGE.—At the twentieth annual meeting, held January 25th, the annual reports of the Board of Directors and of the Treasurer were submitted, and the following officers elected to serve during the present year: President, H. N. Rittenhouse; Vice-President, W. J. Jenks; Treasurer, E. H. Hance; Secretary, A. Robinson McIlvaine; Directors—A. H. Jones, V. H. Smith, H. B. Rosengarten, B. V. Mein, C. Kurlbaum, Wm. H. Gulager, W. J. Miller and Cooper Smith.

GERMAN APOTHECARIES' SOCIETY OF NEW YORK.—At the annual meeting the following officers were elected for the current year: President, P. Fred. Lehlbach; Vice-Presidents—R. Van der Emde, Gustav Mueller; Secretaries—L. G. U. Ruprecht, Chas. Eimer; Treasurer, Theo. Louis; Custodian, Francis J. Zitz; Librarian, Paul Balluff; Trustees—G. Hebberling, Fred. Burghoff. G. Pfingsten; Delegates to the American Pharmaceutical Association—H. J. Menninger, Chas. Schleussner, Chas. Eimer, G. Ramsperger, Adolph Tscheppe.

CINCINNATI COLLEGE OF PHARMACY.—The following officers were duly elected for the year 1881: President, H. F. Reum; Treasurer, Chas. Faust; Recording Secretary, Wm. J. Martin; Corresponding Secretary, F. Schuerman; Trustees for two years—Dr. R. M. Byrnes, Geo. Eger, H. Wrede, A. Stephan; for one year, John Weyer.

ILLINOIS STATE PHARMACEUTICAL ASSOCIATION.—Pursuant to a call issued, about 125 pharmacists and druggists of Illinois assembled in Springfield, Dec. 7, in the Capitol, with the view of organizing a State pharmaceutical association. Mr. George Buck, of Chicago, was elected temporary chairman, and Mr. F. Fleury, of Springfield, temporary secretary. After an address of welcome by Hon. Mayor Irwin, a committee of five was appointed to report a plan for permanent organization. At the second session, held in the afternoon, a constitution and by-laws were adopted and the following officers elected: W. W. Marmon, of Bloomington, President; G. Buck of Chicago, F. C. Bourscheidt of Peoria and P. N. Nichols

of Pana, Vice-Presidents; Frank Fleury of Springfield, Secretary; Henry Smith of Decatur, Treasurer, and A. G. Vogeler of Chicago, J. J. Schubert of Kankakee and Louis van Patten of St. Charles, Executive Committee. During the evening Governor Cullom addressed the meeting, and the association then proceeded to discuss the draft of a pharmacy law, which was adopted on the following day. A committee was appointed to present the bill to the Legislature, and ten members were elected for presentation to the Governor for appointment on the State Board of Pharmacy, in case the proposed law be passed.

After the appointment of various committees, other routine business was attended to, and the association finally adjourned to meet again at Peoria on the second Tuesday of November next, at 10 o'clock P.M.

EDITORIAL DEPARTMENT.

PHARMACISTS AND PHYSICIANS—THEIR RELATIONS.—We are much pleased that the discussion of this subject is not solely left to those who consider themselves faultless, who are quick in blaming upon an entire profession what, perhaps, few are guilty of, and who, without assuming any responsibility themselves, insist that others shall change established usages. The report, which we publish in another place, of a conference between committees of the Philadelphia County Medical Society and College of Pharmacy, is an evidence of this, and the results reached cannot fail of being duly appreciated by all concerned.

A number of medical journals have likewise discussed these matters dispassionately, and it gives us pleasure to be able to select from them a few abstracts of editorials which will show our readers that the intelligent and upright physician does not regard the intelligent and upright pharmacist as his enemy, but as his valuable co-worker. Before quoting our cotemporaries, however, we desire to enlist the aid of our readers in ascertaining where, as we have been informed by a correspondent about a year ago, in this State, a legal decision was rendered, probably about nine or ten years ago, that a prescription was the property of the patient who paid for it, and had the right to do what he pleased with it; that if the prescription was not to be renewed, the physician should state so upon it in writing, that it then became a contract between the two and the apothecary must not violate it for them. This expresses, in the main, the position which we have held in this controversy, but we have not been able to ascertain, by private inquiries, either the place or the nature of the case that led to the judicial opinion quoted.

On the same subject, the "American Specialist" for January, has the following:

If doctors wish to prevent the duplication of prescriptions, it is the patients they should talk to, and not the pharmacists. If the former are of the proper degree of intelligence, and have the confidence in their physicians which they should have, they will not evade many fees or spend at

the druggists much that should go on the doctors' books. If the patients have not this confidence, it is hard on the doctor; but we don't see how lecturing druggists will help it. If, when they have a headache or are bilious, they take the bottle, whose contents did them good before, back to be refilled, either their opinion is correct and, the information as to the remedy having passed to a third party, we don't see how they can be expected to pay for it again; or their opinion is false, and the result—alas! that it must be put so—will conduce to the doctor's pecuniary advantage soon enough.

What is more, we hope this discussion will not be pushed to such a point as shall bring it to the ears of the laity; for this would probably bring about an issue little flattering to our self-respect and little remunerative to our purses.

The best protection a doctor has against any attempt of his patients to go round him and evade his charges, is that which is furnished by his character and skill and the personal relations of friendship and confidence which exist between him and them. If this is sufficient he will probably have no cause to complain, and if it is not it might be well for him to see if the fault is not with himself, instead of trying to get by compulsion what he has not been able to acquire by persuasion.

The "Atlantic Medical and Surgical Journal," November, 1880, speaks of the same topic as follows:

We cannot, therefore, see how physicians can, with propriety, hold druggists to a strict accountability for the refilling of prescriptions, though the patient should have no right to use them the second time. As above stated, we think the quarrel should be between patient and physician, if a quarrel must be had. We must not be understood as holding that refilling prescriptions without the physician's directions is proper, beneficial or safe to the patient. No; we think it is a wrong and unsafe practice, but the damage accrues to the patient more than to the physician.

And, on this and kindred subjects, the "Buffalo Medical and Surgical Journal, December, 1880, says:

From the experience of a good many years we are of the opinion that there are about the same proportion of honorable and upright men in the two professions. The better class of pharmacists are as active and earnest in their efforts to rectify abuses, and to obtain adequate laws for the protection of themselves and the public, as are the doctors; but instead of recognizing this effort, many medical men look only at the injustice done them, and as a remedy propose to dispense with the dispensers. . . . .

After all, are these good fellows so entirely at our mercy? True, they are largely dependent upon our good will and patronage; but if we withdraw that, and turn druggists ourselves, can they not almost as easily turn doctors, and if the opprobrium which attaches itself, at least in the cities, to practicing physicians who are also druggists, is removed, will not the accomplished pharmacist who graduates in medicine have a decided advantage over the younger medical men in the race for professional success?

During the last few years pharmacy has assumed a position which fairly entitles it to rank as a profession, and the best interests of the medical profession are to be advanced, not by ignoring and decrying the value of pharmacy to medicine, but by encouraging the growth of a professional spirit among the pharmacists, and by aiding them in their efforts to rectify abuses by legislative enactment. Meanwhile the physician must protect himself and his patients by exercising a strict oversight over the preparation of his prescriptions, allowing them to be dispensed only by pharmacists whom he knows to be competent and reliable; by *exposing* and *absolutely refusing* to allow his prescriptions to be filled by any druggist who has been detected in *substituting*, or who is known to be guilty of the minor offences of counter-prescribing, etc.; by warning his patients of the dangers they

incur in seeking to get their medicines at the *cheapest* place, and by showing the same consideration, justice and fair play to the faithful apothecary that he has a right to expect from him.

THE ORTHOGRAPHY OF THE METRIC UNITS.—Professor Remington's paper, published last month, elicited a rejoinder which will be found on p. 57, from Prof. Oldberg, after reading a separate copy of the former article and before he had seen our editorial remarks last month; his expressed views are similar to our own, but he complements the facts stated before, and it is now apparent that in no language of Continental Europe has the French method of spelling the words designating the various metric units been adopted. And since, in the scientific literature of Great Britain, the orthography proposed by the American Metric Bureau has been adopted by not a few, we may safely leave it to time to convert those who, in English, adhere to the French spelling, but not to the French pronunciation.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Year-book of Pharmacy, with the Transactions of the British Pharmaceutical Conference at the Seventeenth Annual Meeting, held in Swansea, August, 1880. London: J. A. Churchill. 8vo, pp. 605.

This handsome volume contains as usual, in the first part, abstracts of papers relating to pharmacy, materia medica and chemistry, which, during the year ending June 30th, have been contributed to the journals of Great Britain and other countries. The second part contains the minutes, papers read and the discussions at the Swansea meeting, of which an account will be found in our October number. This, like the preceding volumes issued by the Conference, is of intrinsic and lasting value to pharmacists.

A compendium of Modern Pharmacy and Druggists' Formulary. By Walter B. Kilner, Pharmaceutist. Springfield, Ill. Pp. 478.

We do not believe that the title chosen for this work is a correct one. The book is not a "compendium of modern pharmacy," but simply a "formulary," containing formulas for many pharmacopœial, so-called elegant and other preparations, many of which will be found valuable for pharmacists generally.

According to the preface, the work professes to be mainly a compilation from numerous publications, yet credit is but rarely given to the authors of the formulas and other information selected. We trust that in admitting chapter xiv, "Physicians' prescriptions," the author did not intend to advocate counter-prescribing in such slight (?) ailments as gonorrhœa, vomiting in pregnancy, leucorrhœa, dropsy, epilepsy, cancer, phthisis, etc. With the exception of three or four prescriptions, which are credited to Kilner, we suppose, the author who, as the title page informs us, is not an M.D., but a pharmaceutist—the authors of the prescriptions are not mentioned. We are also decidedly opposed to the sophistications recommended

for making, for instance, Madeira, Malaga and other wines that do not contain any wine at all; citrate of magnesium, without magnesia; oil of origanum by adding linseed oil and oil of turpentine, etc. In the nomenclature adopted, the author is exceedingly inconsistent and also faulty; we give a few examples which are not typographical errors: Potass. chlo., Soda chlo., Tinctura black root, *Gum* camphor, Ex. creosotonis, etc.

A commendable feature of the work is to be found in the formulas for many popular nostrums; whether these give the true composition or are merely imitations we have neither the means nor the inclination to determine. We understand that purchasers of the book will receive the supplements, to be issued quarterly, free of charge for one year.

On the whole, this formulary can only gain, and lose nothing whatever, by a careful revision.

Rocky Mountain Health Resorts. By Chas. Denison, A.M., M.D. Second edition. Boston: Houghton, Mifflin & Co. 1881. Pp. 192.

The author is evidently favorably impressed with the benefits derived by the sufferers from chronic pulmonary disease by living in high altitudes; but this inclination does not appear to influence his analytical study of the subject matter, since to those unacquainted with the localities, a candor is evidenced which does not hide the drawbacks, though even such may serve to explain the author's love for the picturesque scenes of the mighty mountainous chain in the western part of this continent. Although this volume does not pretend to give descriptions of the various localities, yet we consider the information imparted by it as particularly opportune for the members of the American Pharmaceutical Association, who, after attending the next meeting at Kansas City in August next, expect to get a glimpse of the Rocky Mountains. Invalids suffering from pulmonary complaints will find in the volume much to interest them.

Report on the Culture of the Sugar-beet and the Manufacture of sugar therefrom in France and the United States. Prepared, under the direction of Hon. Wm. G. Le Duc, Commissioner of Agriculture, by Wm. McMurtrie, E.M., Ph.D., etc. Washington: Government Printing Office. 8vo, pp. 294.

An interesting and important volume, published at a time when the cultivation of the beet for the purpose of obtaining sugar is attracting so much attention in the United States. The book is rendered more useful by the addition of a number of maps, and of illustrations of different varieties of beets and of apparatus and machinery adapted to the manufacture of sugar.

Handbuch der Botanik. Von Dr. N. J. C. Müller. II. Band: Allgemeine Botanik; II. Theil: Allgemeine Morphologie und Entwickelungslehre der Gewächse. Heidelberg: Carl Winter's Universitätsbuchhandlung, 1880. 8vo, pp. 482.

Hand-book of botany. Vol. II: General Botany; Part II: General morphology and development of plants.

The first volume of this work was noticed on page 586 of our last volume; for the one now before us we repeat what we then said of the former, that

it is instructive as well as suggestive of further experimentation. The subject is divided into the following four principal parts: Theoretical consideration of development and descendance; the natural circles of relation and generation; adaptation to the climatic period and the formation of the conducting tissues and of the root; flowering plants and adaptation of the three organs, stem, leaf and hair. Typography and illustrations—the volume contains 277 woodcuts—are very commendable.

Ueber das Milchsäureferment und sein Verhalten zu Antiseptica. Inaugural dissertation. By Hermann Meyer, M.D. Dorpat. Pp. 66.

On the lactic acid ferment and its behavior to antiseptics.

His investigations lead the author to the conclusion that the ferment in question belongs to the fungi (schizomycetes), and passes through filtering and parchment paper; it is more easily affected by antiseptics than bacteria, and is destroyed by boiling and by the electric current. The most efficient antiseptic is corrosive sublimate (1 part to 3000 parts whey); then follows iodine (1:1000), hydrocyanic acid (1:853), oil of eucalyptus (1:400), salicylic acid (1:200), sulphurous, also benzoic, acid (1:156), chlorinated lime (1:55), creasote, also thymol (1:50), carbolic acid, also borax (1:20) To be effectual, glycerin, alcohol and chloroform had to be used in excess.

Chemische Untersuchung der Samen von Pinus Cembra. Von Nicolai Carl Schuppe.

Chemical examination of the seeds of Pinus cembra.

The seeds of this Siberian pine contain water 3·95, ash (containing 1·03 per cent. P_2O_5) 1·34, fat 46·41; legumin, globulin, etc., 3·52, other albuminoids soluble in water 2·54, albuminoids insoluble in water 3·00; mucilage and other non-albuminous compounds soluble in water 3·94, resin soluble in alcohol, trace; cellulose, etc., 35·30.

The Chemists' and Druggists' Diary, 1881. Published by the London "Chemist and Druggist."

Twelfth Annual Report of State Salt Inspector S. S. Garrigues, showing the operation of the inspection law during the past year, with comparative statistics of the salt product for a series of years. East Saginaw, Mich.

The asylums of Europe. By Geo. M. Beard, A.M., M.D. Cambridge, Mass.

Reprint from the Boston "Med. and Surg. Jour.," December 23d.

Phthisis pulmonalis and its treatment with hypophosphites. By L. de Brémon, M.D. New York: John Newton.

The American Medical Bi-weekly, New York, which was formerly published at Louisville, Ky., was some time ago discontinued on account of the protracted illness of its editor, Dr. E. S. Gaillard. On the recovery of the editor, he has resumed its publication and considerably enlarged it. Price $1.00 per year.